THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXIV. | DETROIT, MICH., AUGUST 15, 1910. | Third Series, Vol. XXVI, No. 8.

ORIGINAL COMMUNICATIONS.

CALOMEL TO INCREASE ELIMINATION IN PREGNANCY.[1]

BY STRICKER COLES, M.D.,

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About ten years ago, in a discussion before this society, the use of calomel to increase elimination in pregnancy was mentioned by the writer, and since then some of the members then present have told of the good results they have obtained from this use of the drug.

Having had continued gratifying results during all these intervening years, and never having seen this use of calomel advanced by others, it would seem worth while to bring the subject before the society again.

Just how calomel acts does not seem clearly understood, and there have been great differences of opinion as to its action on the kidneys and liver. Most authorities agree that in small doses frequently repeated, or in large single doses, it increases the flow of the urine, bile, and secretions of the intestinal glands; and some claim that it stimulates the pancreas and the glands of the skin.

The effect that particularly deserves our consideration is the action it has upon all the cells of the body, effecting the proper removal of waste of each cell, as well as the stimulation of the cells of the liver and kidneys, increasing their activity, and in this way removing the excrementitious products from the blood.

This action of calomel is best obtained by giving from 1/20 to 1/10 grain three times a day, which course can be safely continued throughout pregnancy by omitting it for three or four days every two weeks. To get the best results from these small doses, it should be well triturated with bicarbonate of soda, which increases its action and lessens the danger of salivation.

For the past twelve years the writer has made this method of administration a routine treatment in all pregnant cases where elimination was deficient, as indicated by headache, slight disturbance of the digestion, and diminution of solids and urea excreted in the urine. Usually in less than a week after beginning this treatment these symptoms will disappear, and the urea and solids become normal. Then the patient is instructed to discontinue the powders, or tablets, until she again feels the need of them. In cases seen with other physicians, in which other diuretics and purgatives had been administered without success, the writer has found the trouble to clear up within a few days on calomel alone.

Calomel should not be employed in large doses as a purgative, however, during pregnancy, as it cannot be eliminated freely after accumulation, and may have to be stopped before it accomplishes its work, because of the danger of salivating the patient. The writer has had but one case of salivation, and in that instance the patient, finding her health improved on taking ¼ of a grain of calomel without soda, three times a day, continued this treatment, con-

[1] Read before the Philadelphia Obstetric Society.

trary to directions, without intermission for over three months! Even in this case only slight salivation resulted, without any serious effect on the patient, save that she was greatly distressed at having to forego the further use of the drug.

DISCUSSION.

Dr. Barton Cooke Hirst: I have good opportunity for observing the value of calomel in the routine treatment of pregnant women, having for some time given a course every month as a routine practice to patients, unless they have some idiosyncrasy against it. It is usually a good thing to do. It relieves the liver and helps elimination, and I think it a valuable safeguard against toxemia, and in the preventive treatment of eclampsia.

Dr. Daniel Longaker: While I have not had the extensive experience that Dr. Coles narrates, I am inclined to think that a note of warning is probably in place with reference to the use of calomel during pregnancy. In cases of albuminuria I believe there is distinct danger of producing aggravation of the kidney condition. I am of this opinion because of some comparatively recent experiences. For instance, a man with an evident chronic interstitial nephritis developed an acute hemorrhagic nephritis and uremia soon after the use of moderate doses of calomel. His condition, I believe, was aggravated by the use of the mercurial. Some other cases I have observed in the same line. Discussing the subject with my friend, Dr. Robertson, upon whose opinion I lay high value, my feeling of uncertainty with reference to the use of calomel in these particular cases is distinctly emphasized. I believe there is danger in the chronic kidney case of an aggravation and the development of a serious condition.

There comes to my mind another case which will serve to direct attention to another point: A primigravida, the subject of moderate toxemia, in the sixth month was symptomatically treated with blue mass. Premature labor promptly followed, a living 2½-pound baby being expelled from a normal healthy uterus. Looking up the subject of calomel rather hastily in an old book which I believe is not to be despised—Stillé on Therapeutics, Vol. II, p. 796—I find: "In nephritis there is no special indication for mercurials." And: "In albuminuria and diabetes the use of mercury is sedulously to be avoided." This may appear dogmatic and ancient, but I believe there is some reason for it.

Dr. William R. Nicholson: I have routinely followed for some time the plan which Dr. Coles has brought before us—the use of calomel in divided doses at intervals, usually every two weeks, during pregnancy. I have felt that it was a great advantage, a great safeguard, and I don't quite see the danger of any damage being done. Dr. Coles guards patients against any possibility of salivation, which seems to me to be the only possible danger. The ordinary case of albuminuria in pregnancy not being a regular nephritis, it does not seem to me that any contraindication which a true nephritis may constitute can be present in these cases. I am strongly in favor of calomel and soda. I see no advantage in putting anything else into the prescription, as some of my friends do. I do not wait, as I understand Dr. Coles to say he did, for early symptoms of decreased elimination. I give calomel routinely after the fourth month of pregnancy.

Dr. Barton Cooke Hirst: I think for the benefit of the profession at large, and for our own safeguard, we ought to be aware of the bare possibility of calomel inducing labor. I wished to prescibe it to-day in a private patient, but she very sensibly said that she wouldn't take it, because whenever her menstruation was delayed she was in the habit of taking calomel, and that the moment she was under the influence of it the menstruation appeared. To safeguard ourselves, and to warn patients of this bare possibility, I think some mention ought to be made of this fact. Otherwise the patient might blame the physician, and the physician might find himself involved in a suit for damages. I always make it a point to ask patients whether calomel has any effect upon menstruation, and I make some men-

tion of the possibility of an interference with gestation in unusual and extraordinary cases.

Dr. Daniel Longaker: Relative to the point brought out by Dr. Hirst, I did not have time to look up the details of the case to which I am referring, but I am quite sure that in a certain case of pregnancy in which a five-grain dose of blue mass was given labor was promptly brought on. The conditions about the uterus were entirely normal, a living 2½-pound baby being born near the seventh month. It is perfectly clear to me that labor promptly followed the single dose of five grains of blue mass.

Dr. Coles (closing): Dr. Longaker referred to the unfavorable action of calomel and blue mass noted in an old book on therapeutics. I was interested to read in an article published in 1850—and there were many written about this time—the statement that calomel should not be given in any way, shape, or form, as it was "very deadly" even in minute doses. This, of course, is not a fact, as it is not an irritant in the doses recommended in my paper, and can be given with great benefit to patients with beginning kidney change, or even in Bright's disease. I have never seen the slightest tendency to hasten or bring on labor from this administration of calomel, and I do not hesitate to give it even when the uterus is irritable, and contracting more frequently than is normal. The point I wish especially to bring before the members is, that small doses given three times a day will act better to increase elimination than one large dose, or small doses more frequently repeated. It will not only prevent toxemia in many cases, but will do much to relieve this condition when it is already developed.

SOME OBSERVATIONS ON THE ACTIONS AND USES OF SALICYLIC ACID AND ITS PREPARATIONS, WITH SPECIAL REFERENCE TO RHEUMATISM.

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Salicylic acid, especially its sodium salt, is a drug the interest in which at the present time depends on its value as a cure, or rather as a specific, for acute rheumatism. Its value as such has been long recognized, but there is still a diversity of opinion as to the precise nature of its action in acute rheumatic fever.

The use of salicylic acid in rheumatism and fever is not a recent innovation. It has been used from time immemorial, as, for instance, the bark of *Salix alba,* or willow, in intermittent fever, and an infusion of some species of willow has long been used by the Hottentots in South Africa for the cure of rheumatism.

But even with all our recent experiments and researches, our knowledge has not far advanced since the days of the Hottentots, who used it without knowing how it effected a cure in a particular disease. The present consensus of opinion is that rheumatism is due to some pathogenic bacterium, although the precise nature of the organism has not yet been ascertained. And if rheumatic fever be a specific disease, we are justified in believing a specific virus to be its cause. No doubt the character of the temperature, the joint affections, the tendency to relapses, the sweats, the leucocytosis, and the liability to cardiac affections give us an image of an acute septic infection. Indeed, some authorities aver that it is of the nature of a pyogenic organism, probably streptococcic. But the fact that the salicylates have no effect on other streptococcic infections and that in rheumatic fever the joints rarely suppurate, negatives the above statement. Still we cannot totally ignore the possibility of streptococcic infection, and there can be no question that there are some varieties of rheumatism which are really due to pyogenic bacteria. Menzer, who holds that rheumatic fever is a streptococcic infection arising from absorption in the upper air-passages, has for several years treated this

disease by the injection of a polyvalent anti-streptococcic serum, and he claims that though this is slower than the salicylate method, the final results are most satisfactory, especially as regards the endocarditis and liability to relapses. On the other hand, a view which meets with acceptance in several quarters at the present time is that rheumatic fever is due to a specific coccus (diplococcus or micrococcus rheumaticus). The names of Poynton and Paine, Walker and Beattie may be mentioned as supporters of this view. But the large number of negative results obtained in cases of rheumatism rather suggests that this microbe is only occasionally present and that its presence is a complication of the rheumatic process. Be that as it may, there can be no doubt of the fact that rheumatism is due to some specific micro-organism, and that in various articular affections the microbes, when they obtain access to the body, find a suitable nidus in synovial membranes, and we know that besides the acute forms, other hybrid forms or pseudo-rheumatism can be distinguished, which are also due to organisms gaining entrance into the joints, such as the gonococcus, pneumococcus, staphylococcus, etc.

How do these salicylates act in rheumatism? Before discussing this point, it is first of all necessary to form an idea of what takes place in an inflammation at a particular part. In acute rheumatic inflammation of a joint there is much pain, heat, swelling, and an increase of tension, with the production, at the seat of the lesion, of an excess of CO_2. This CO_2 lies nascent there. In whichever form salicylic acid is taken, it is converted into a sodium salicylate in the blood and circulates as such. Again, it should be remembered that its value depends not so much upon the salt itself as upon the free acid, which is a powerful antiseptic; whereas the salt itself has little or no antiseptic virtue whatever. The sodium salicylate, coming in contact with the nascent CO_2 generated at the inflamed part, is split up into salicylic acid, which exhibits its antiseptic properties. At this point we had better refresh our memory with the physiological fact that the carbonic acid and the phosphoric acid of the blood are constantly struggling for the possession of sodium. The salts formed by them depend upon their relative masses. If CO_2 is in excess, we get sodium carbonate. Further, the tension of CO_2 in the tissues is at its highest. In fact Köhler has attained the above condition of the liberation of salicylic acid from a sodium salt in the laboratory by using the blood of a suffocated animal. The action of salicylic acid or salicylate in rheumatism is, therefore, general and local. It might be argued here that if the antiseptic property of the acid, as stated above, is the cause of the cure of rheumatism, why do not other similar antiseptics or even better ones serve the same purpose? We should remember that we have in this one drug other qualities which admirably adapt themselves to the treatment of rheumatic fever. We have its antithermic, analgesic, cholagogic, and the eliminatory properties all in one, and therefore this is *par excellence* the best remedy that we can think of for such an ailment. Furthermore, we must take into account the susceptibility of different bacteria to different substances. Some flourish on one medium, while others die in the same. There can be no doubt, however, as to the special sensitiveness of the specific micro-organism of acute rheumatism to salicylic acid, any more than that of syphilis to mercury and of malaria to quinine.

On the same principle, although not as a specific, as in rheumatism, but as an antiseptic and analgesic, it has been found that the use of salicylate in many other acute forms of local inflammation—for instance, tonsillitis, urethritis, orchitis, etc.—works well and relieves both pain and distress. In inflammations of some internal structures the use of salicylate has given me encouraging results. The fact that salicylate has some remote local action suggested the use of the oil of gaultheria locally over such parts. And we find that better results are obtained by combining internal administration with external use.

Considering, therefore, the value of the

above drugs as a specific and that their action is local over the inflamed parts, it naturally suggests the idea of treating these cases of arthritis locally. I therefore decided to deal with these cases by the injection into the joints of solution of sodium salicylate. This is expected to act locally by the liberation of salicylic acid and to get the analgesic, antiseptic, and the specific action of the drug displayed there. This has been successfully carried out by Santini (*British Medical Journal,* Oct. 22, 1904), but he gives no explanation; he only observes that this treatment has given better results. Moreover, the tendency to relapses was more uncommon; his injections were endoarticular and in some cases periarticular.

I fear lest I be misunderstood. While advocating the new injection method I am not in any way deprecating the value of the internal administration of the salicylates. The advantages which may be claimed for such a method are that the desired effect is obtained early, and that when big doses are not tolerated or are inadvisable for some other reason, good results are obtained by a small amount of the drug. It may also be mentioned that by the injection we attack the organisms directly at the joint, and therefore when the local lesion is checked by such means only small doses of the drug may be exhibited for its other general effects, and to eradicate the poison from the system.

Again, Whitla recommends a deep hypodermic injection of carbolic acid in the treatment of synovitis and other joint swellings, and Senator speaks favorably of Kunze's method of injecting one-per-cent solution of carbolic acid in acute rheumatism. Further, Gillespie has recorded several cases in which a 10-per-cent solution has been used with marked success so far as the relief of pain was concerned. The methods of treating these cases by the injection of carbolic acid corroborate my views as expressed above. It appears to me that the curative value of these methods lies not in the carbolic acid, but in its conversion into salicylic acid. When we study the chemistry of salicylic acid, we find that the laboratory method of its preparation is by the action of CO_2 upon some carbolates, and we know that the carbolic acid is transformed into a carbolate in the blood and tissues. Therefore, when carbolic acid is injected into an inflamed part the carbolate comes in contact with nascent CO_2, the result of local inflammation, with the effect that free salicylic acid is formed, which asserts its influence there.

The above, therefore, is the best possible explanation that can be furnished at present for the different methods of treating arthritis locally by injections of sodii salicylas or carbolic acid. Further observations or experimental facts will no doubt support this new departure in the treatment of acute rheumatic arthritis.

I have now to make a few more observations on the salicylate as an antipyretic and hepatic stimulant. There are few drugs in the Pharmacopœia which can excel sodium salicylate in its action on the liver. It stimulates the latter to increased activity, causing an increase in the flow of bile, which is rendered more watery and is at the same time excreted under a higher pressure. In ordinary fever with some hepatic derangement and congestion, it has invariably been used with an ordinary diaphoretic mixture, with good results. Moreover, the general discomfort and the indefinite sort of pain over the whole body, so often complained of by such patients, are, as a rule, relieved by this drug. Salicin is also a valuable remedy in some forms of fever; after the acute paroxysms are checked by quinine, it is sometimes observed that a slow form of fever persists not amenable to this drug. In such cases a combination of quinine and salicin yields better results.

In a few selected cases of infantile biliary cirrhosis, continued use of salicin along with ipecac, euonymin, and rhubarb has been attended with much success. But how it has acted I am not in a position to explain at present, unless some more light is thrown on the real pathology of this disease. Whether the increased fluidity of the bile, or the excretion of more solid and

increased activity of the organ help to reduce its size, or some other action leads to such good results, I leave to some future observer to determine. However, it is worth trying in suitable cases.

Considering, therefore, the value of the above drugs, their shortcomings may almost be overlooked. One of the chief objections to their use is that they are powerful depressants.

When using the salicylate in large doses, as in acute rheumatic fever, one should always use the salt prepared from the oil of gaultheria. This has the advantage of not being depressant and gives better results, as it does not contain any of the impurities of the artificial preparations. When not using the drug in big doses the synthetic product answers the purpose equally well, and no untoward effects have been observed from its cautious use.

I cannot conclude this paper without making some reference to the drug aspirin. This has of late years secured a place in the front rank of antirheumatic remedies. It is rapidly supplanting salicylic acid and the salicylate of soda, possessing, as it does, the advantages over any of the other drugs in not being an irritant to the stomach and leaving no bad after-effects. It has also some special virtues of its own, but I refrain from making comments on this drug.

CARBON-DIOXIDE SNOW IN CERTAIN CUTANEOUS DISEASES.

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While treatment of certain cutaneous diseases by intense refrigeration, mildly or actively destructive according to degree and application, has been from time to time recorded, and liquid air had several times been publicly and previously lauded by A. C. White and others, it remained for Dade's brilliant demonstration of the use of liquid air[1] at the meeting of the American Dermatological Association in New York, 1905, to give this method an established and accepted standing. Liquid air as an efficient, and probably the best, destructive refrigerant or freezing cauterant, has since had the indorsement of Jackson, Saalfeld, Beckett, Trimble, Zeisler, Whitehouse, and others, but the almost insuperable difficulty in obtaining and preserving it has almost led to its entire abandonment, the more readily owing to Pusey's valuable discovery (1905) of a practical substitute for it in the easily procurable carbon-dioxide snow.

The degree of cold of carbon-dioxide snow is not so low as that of liquid air, but it is low enough, and the action is about the same, and its application is more readily managed. Since then its value has been repeatedly attested by Pusey, Heidingsfeld, Zeisler, Bowen and Towle, Sutton, Jackson and Hubbard, Hutchinson, Gottheil and Schalek, and others.[2] My own experience and that of my associates (Dr. E. J. Stout and Dr. H. K. Gaskill) in the Jefferson Hospital skin service have been equally favorable; liquid air has not been used in our service.

Carbon-dioxide snow is usually obtained from large steel cylinder retainers of liquid carbon dioxide, supplied directly by manufacturers of it or by soda-water fountain supply companies; it can be kept in the office or cellar and drawn from as the snow is needed. A full cylinder is furnished at

[1]Literature concerning therapeutic uses of liquid air: A. C. White, *Medical Record*, New York, vol. lvi, 1899, p. 109; *Jour. Amer. Med. Assn.*, vol. xxxvi, 1901, p. 426; *Interstate Med. Jour.*, vol. ix, 1902, p. 657; and *Gaillard's Med. Jour.*, vol. lxxix, p. 410. Saalfeld, *Dermatolog. Zeitschr.*, 1900, p. 997. Beckett, *Australasian Med. Gaz.*, vol. xxiv, 1905, p. 313. Trimble, *Med. Rec.*, New York, vol. lxviii, 1905, p. 58, and *Jour. Cutan. Dis.*, vol. xxv, 1907, p. 409. Dade, Trans. VI International Dermat. Congress, 1907, vol. ii, p. 672. Whitehouse, *Jour. Amer. Med. Assn.*, vol. xlix, p. 371.

[2]Literature concerning therapeutic uses of carbon-dioxide snow: Pusey, *Jour. Amer. Med. Assn.*, vol. xliv, 1907, p. 1354, and *Berlin. klin. Wochenschr.*, June 15, 1908. Zeisler, *Dermatolog. Zeitschr.*, 1908, p. 409, and *Jour. Cutan. Dis.*, 1909, p. 33. Bowen and Towle, *Boston Med. and Surg. Jour.*, vol. lviii, p. 868. Heidingsfeld, *Ohio State Med. Jour.*, August, 1908. Heidingsfeld and Ihle, *Cincinnati Lancet-Clinic*, Jan. 30, 1909. Hubbard, *Jour. Cutan. Dis.*, 1908, p. 134. Jackson and Hubbard, *Med. Rec.*, New York, April 17, 1909. Sutton, *Dublin Jour. Med. Sci.*, July, 1909, and *Jour. Amer. Med. Assn.*, vol. lii, 1909, p. 464. Gottheil, *Internat. Jour. Surg.*, vol. xxii, 1909, p. 7. Schalek, *Dietetic and Hygienic Gazette*, November, 1909.

a rental of a few dollars and contains a sufficient charge for one or two months' average use. This is a convenient and the cheapest source of supply for dispensary and hospital use, and this we use at the Jefferson Hospital Skin Dispensary. It is also the usual source of supply for the office with those physicians who have employed this method of treatment. It is, however, a clumsy apparatus, and for the office, unsightly. I have found a much more elegant and convenient source in the small cylinder (12 inches long, 1¼ inches in diameter) of liquid carbon dioxide sold by certain automobile supply houses for the easy inflation of the tires; one cylinder furnishes ample snow for a single treatment, or for several patients if treated immediately one after the other. With several of these cylinders and the necessary valve-cock at hand one is sufficiently well supplied. Each cylinder costs one dollar, but after use is exchangeable for a fresh one for twenty cents; the valve-cock costs two dollars. When necessary an angioma in an infant, or any other case, can be treated at its home, as the cylinder and the valve-cock can be easily slipped into one's pocket.

The method of procuring the snow is simple. A somewhat thick chamois skin (or a thin one doubled) is tied or held firmly over the gas nozzle in such a manner as to leave a small pocket opposite the gas outlet. The outlet end of the cylinder, if the large one is used, should be dipped down about 6 inches lower than the other end; if the small cylinder, the outlet end is held about perpendicularly down. The gas is then turned on (by puncture of the seal in the small cylinder), and the snow collects in the chamois pocket, which when ready, or sufficient snow has been deposited, is detached from the nozzle. The snow is then either manipulated through the chamois to form a ball, which may be cut to the required shape or size, or it may be packed or rammed into a hard-rubber mold, such as an ear or nose speculum or a small section of a larger tube. It is then ready for the application. The snow-pencil or mass is to be handled by the operator with a small piece of chamois so as to avoid personal damage to the skin; it is then applied to the diseased patch with moderate pressure, and held there from ten to thirty seconds—even longer in deep-seated disease. The duration depends upon the object desired: as a stimulant and discutient, three to thirty seconds; and when destructive action is desired, from thirty to sixty seconds or longer. In withdrawing the snow-pencil or mass the area is seen depressed and frozen white and hard, with sometimes a slight narrow surrounding zone of erythema. It thaws out in a minute or two, becomes red, and possibly slightly swollen; later, trifling vesiculation or a distinct bleb or blister forms. This, if prominent, can be punctured. In a few days slight exfoliation or thin crusting usually takes place, and after a time drops off, leaving a scarcely noticeable scar; in cases in which the action has been superficial, scarcely more than a whitish mark, sometimes no permanent trace. When the action has been long continued and with considerable pressure there may follow thin sloughing, usually of a dry or slightly moist character. There is not much (rarely objectionable) pain, as a rule, in the application, but while thawing and for a short time subsequently there may be in some instances considerable discomfort, rarely troublesome. In most instances no after-treatment or dressing is necessary, unless on covered parts where the clothing may rub. Later, the superficial abrasion or ulcer may need a simple protective application. If later observation shows that the action has not been sufficient, the snow application is to be repeated. A large area of disease should not be treated at the same time, but in sections of an inch or so in diameter, and in such instances it is sometimes advisable to apply the snow in square-block form, so that the surface may be treated evenly.

We have found this method of treatment valuable in quite a number of dermatoses. We have used it now quite frequently in lupus erythematosus, and with, considering the intractability of the disease, gratifying

effect. At first it is advisable to make the application to a limited spot, not more than a half-inch in area, so as to gauge the action. If the disease is of the superficial type, with little, if any, infiltration, application should at first not be more than of twenty seconds' duration; if the area is of the infiltrated, sluggish, thickened type, about thirty to thirty-five seconds. The effect of this first application gives an intimation of the duration in subsequent treatments; and very often, in extensive cases, if the discomfort of the first application has been insignificant, two or three scattered areas can be treated at the one time—each not more than an inch in diameter. Another disease or blemish in which this refrigerant method has usually proved satisfactory is in pigmented nevi of various types, and even in the pigmented hairy nevus; the hair in the last often being destroyed and disappearing along with the pigmentation. In this malady, as in all, the duration of the application and the amount of pressure are to be varied to suit the individual case; often it is rather better to underdo than to overdo, as one or two repetitions can be easily made if required. In the various types of angioma the method has also been found useful, most brilliantly so in the small circumscribed elevated types seen in early infancy; it is least successful in the so-called "port-wine marks," in which scarcely more than a lightening of the color is to be expected in the average case. In tattoo marks we have had varying results; it must be used boldly and deeply if any result at all is to be expected. Upon the whole it has been rather disappointing in the removal of these stains. In the wart-like brownish and blackish keratoses developing on the face, backs of the hands, etc., in people advancing in years, it has proved of service; also in such patches even after epithelial degeneration has set in, if employed boldly so as to obtain active obstruction. In other superficial epitheliomata it has proved successful in some cases, but is inferior to other methods. The same might be said of its use in lupus vulgaris—if there is much infiltration its action is usually insufficient; but in those of superficial character its action is favorable. A few observers have seen good results from its application in xanthoma. As a stimulant and discutient in sclerous, thickened patches of eczema, lichen planus, etc., it is sometimes of value, the application being of but a few seconds' duration.

In conclusion the experience of most observers, including our own, goes to show that this convenient refrigerant—carbon-dioxide snow—is a valuable addition to cutaneous therapeutics.

VULVITIS, VAGINITIS, AND VULVOVAGINITIS OF CHILDREN.

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Inflammation of the vulva and vagina is almost invariably due to bacterial infection. There are times when the reduction or loss of natural immunity renders the structures less resistant. This occurs coincidentally with menstruation, pregnancy, and the puerperium, and as a result of a number of other causes, such as lack of cleanliness, scratching, masturbation, coitus, gynecologic manipulation, septic uterine or vaginal discharges, fecal or urinary fistula, ammoniacal or saccharine urine (diabetes), thrush (oidium albicans), or intestinal parasites. It is a deplorable fact, however, that the gonococcus is at all ages the most frequent and important cause.

Vulvitis.—The signs and symptoms are usually clear enough to render the diagnosis of vulvitis easy, but it is often difficult to distinguish one variety from another. The difference between simple and gonorrheal vulvitis is merely one of degree and tractability. In the acute type of both forms the parts are reddened, swollen, and covered with a mucopurulent or purulent discharge. When it is of gonorrheal origin the symptoms are especially pronounced. The urethra is then involved, and besides

burning pains of the inflamed mucous membrane, there is frequent scalding urination. A tendency for the infection to invade Bartholin's glands (Bartholinitis) as well as the inguinal lymphatic glands exists. The latter are enlarged and may even go on to suppuration (bubo).

With a history of a suspicious intercourse, and the finding of gonococci in the discharge, the diagnosis of gonorrheal vulvitis is rendered positive. But unfortunately we rarely see these cases until the acute symptoms have subsided, or more frequently it occurs that the infection is a passive one from the start. The woman complains of a moderate but persistent leucorrhea, occasional burning urination, and hyperesthesia of the parts, especially at the beginning of coitus. On inspection, the sensitive places are seen to be reddened areas around the margins of the urethral orifice, and about the opening of the ducts of Bartholin's glands (maculæ gonorrhoicæ of Sanger). The inflamed area in the neighborhood of the urethra is due to the persistence with which the infection remains in Skene's ducts. Its presence can be determined by obtaining a drop of pus from the urethral orifice by pressure along the anterior vaginal wall. In some cases it is even possible to express pus from the orifices of the ducts of Bartholin's glands (Bartholinitis), or the ducts or glands themselves may be the seat of an abscess. (Suppuration of Bartholin's glands from other sources is so rare that they may be eliminated.) The hyperemic areas are extremely sensitive and often bleed on the introduction of the finger or speculum into the vagina. Pointed condylomata, and associated diseases of the vagina, cervix, tubes, and ovaries, are all further confirmatory evidences of the disease.

Although a bacterioscopic examination should be made to corroborate the diagnosis in all cases, it is unfortunately true that it often fails in those in which it is most needed. The absence of the gonococcus at this time, however, is no indication that the disease is not of gonorrheal origin. The examination for gonococci should always be made during the menstrual period. At this time the vaginal secretions are less acid, and the congestion of the pelvic organs predisposes to the liberation of the bacterial flora.

To obtain the discharge for bacterioscopic examination, place the patient in the dorsal position, in a good light, on the edge of a bed or table. By introducing a sterile needle with a good-sized eye into Skene's or Bartholin's ducts sufficient discharge can be obtained to make a thin smear on a cover-glass.

Follicular vulvitis is the result of an infection of the sebaceous glands and hair follicles. The labia are covered with small papules and pustules that give rise to intolerable itching.

Treatment of Vulvitis.—During the acute stage of the inflammation rest in bed should be insisted upon. The diet should be free from all highly seasoned foods, red meats, tea, coffee, and other stimulants. Special attention should be given to the bowels, and the patient encouraged to drink large quantities of water, to render the urine bland and non-irritating. The burning pains on urination can usually be controlled by a prescription containing tr. hyoscyamus gtt. x and ammonium benzoate grs. x, in ℥j of the infusion of buchu, taken after each meal and before retiring. If necessary for the pain and restlessness, ammonium bromide grs. x may be added; or 5-grain doses of chloral hydrate can be given every two or three hours.

The parts must be kept free from the discharge by frequent irrigation (every three or four hours) with solutions of boric acid 3 per cent, bicarbonate of soda 1 per cent, sodium chloride 1 per cent, or bichloride of mercury 1:5000. If the infection is gonorrheal, and has not extended beyond the vulva, irrigate the parts with great care so as not to introduce the nozzle of the syringe into the vaginal canal. In the intervals between irrigations, the vulva should be covered with gauze that has been wrung out of hot boric acid solution (3 per cent), or bichloride solution (1:5000). The gauze can be kept moist and hot by cover-

ing with oiled silk or rubber dam and a hot-water bottle. When the parts are much swollen and the pain severe, pads wet with lead-water and laudanum, and an ice-bag, will give the greatest relief.

After the acute symptoms have subsided, the itching and burning are relieved by applications of soothing and antiseptic powders of acetanilide, boric acid, bismuth subnitrate, or oxide of zinc; or ointments of phenol 3 per cent, benzoated oxide of zinc, acetanilide 10 per cent, ichthyol 25 per cent, or camphor and carbolic acid, each 2 per cent, with oxide of zinc as a base. In obstinate cases of a chronic type, underlying constitutional disorders, such as diabetes, gout, and rheumatism, should be looked for and appropriate treatment given. In gonorrheal vulvitis the entire mucous membrane should be treated with an application of a 10- to 20-per-cent solution of silver nitrate, the strength of the solution depending upon the severity of the case. The application can be made by placing the patient in a good light, in the dorsal position, on the edge of a bed or table. The vulva, after irrigating with sterile water, should be wiped dry. The silver solution is then applied directly by means of pledgets of cotton, or an atomizer with a strong spray. The nozzle should always be of hard rubber, as the effect of the silver salts on the metal soon renders it useless. Care should be taken that none of the many folds and crypts of the vulva are overlooked, and especial attention given to the surfaces of Bartholin's ducts and the urethra. Following the application of the silver solution, the vulva should be smeared with sterile vaselin and a pad covered with the same be worn. Rest for several hours and a sedative are necessary.

Frequently, after all signs of the disease have disappeared in other parts, infection still remains in the ducts of Skene, or Bartholin's glands, that may at any time give rise to fresh attacks of gonorrhea. It is not unusual for women who have undergone operations for the removal of their ovaries, tubes, and even of the uterus, to subsequently develop a gonorrheal vulvitis or vaginitis in this way.

To completely eradicate the disease and prevent recurrences, it may not only be necessary to cauterize the urethral mucous membrane, but also to destroy the infected tissues of Skene's and Bartholin's glands. The method of doing this is as follows: Anesthetize the parts by placing in the urethra, and allowing to remain five minutes, cotton saturated with a 10-per-cent solution of cocaine, or by an injection of Schleich's fluid. Introduce a fine probe, and with a pointed bistoury lay open the duct for its entire length out through the vaginal wall. The urethral mucosa and incised ducts are then cauterized with a 20-per-cent solution of silver nitrate. In pus collections of Bartholin's ducts or glands, anesthetize locally with ethyl chloride, make a free incision, cauterize with strong carbolic acid, or a 20-per-cent solution of silver nitrate, and pack with iodoform gauze. The incisions are not allowed to heal until the secreting surfaces are entirely destroyed. Cauterization is to be repeated if necessary.

In cysts of Bartholin's glands, a general anesthetic had better be given and the entire sac dissected out.

In follicular vulvitis, in addition to keeping the parts clean with antiseptic solutions, it may be necessary to shave the vulva and cauterize the individual follicles. The application of one of the following ointments is usually sufficient to bring about a cure:

℞ Acidi carbolici,
Camphoræ, ää grs. xv;
Ungt. zinci oxidi, q. s. ℥j.
Misce fiat ungt.

℞ Hydrargyri ammoniati, ℥ss;
Ungt., q. s. ℥ij.
Misce fiat ungt.

℞ Mentholi, grs. xv;
Ungt., q. s. ℥j.
Misce fiat ungt.

℞ Ungt. diachylon.

℞ Ichthyol, ℥ij;
Lanolin, q. s. ℥j.
Misce fiat ungt.

Vaginitis.—The vagina is not as prone to

infection as the other parts of the genital tract. In all probability this is due to the following conditions: That the stratified squamous epithelium is more resistant to bacterial invasion; that there are no crypts or glands lined with columnar epithelium, the favorite habitat of the gonococci; the acid secretions of Döderlein, and the readiness with which the vagina cleanses itself.

Symptoms and Diagnosis of Vaginitis.—In the acute forms the mucous membrane is swollen, diffusely reddened, and covered with a mucopurulent or purulent discharge. In gonorrheal vaginitis the inflammation is more intense, the folds and papillæ swell and project at a level with the mucous membrane, which give it a granular appearance. Besides the burning pain, the feeling of fulness in the vagina and the perineum, there are symptoms of complicating urethritis and vulvitis (see vulvitis). In the chronic type the infection is usually confined to reddened sensitive areas in the fornices of the vagina and vulva. In senile vaginitis the ulcerations frequently give rise to cicatricial contractions and adhesions. The only evidence of the disease is a serous discharge which at times is slightly blood-stained. Von Winckel described a form of vaginitis (emphysematosa) that occurs in pregnant women. Small vesicles filled with gas develop in the mucous membrane, under the influence of the gas-forming microörganisms.

The diagnosis of vaginitis is based on the changes in the mucous membrane and the character of the discharge. With the aid of a speculum and bacterioscopic examination it is usually quite easy. At times, in chronic cases with negative findings on examination of the pus, it may be difficult to determine if the inflammation is gonorrheal or not (see diagnosis of gonorrheal vulvitis). If the facts can be elicited that the disease began with acute symptoms in the vulva and urethra soon after coitus, or after marriage, or the discovery that the husband has recently had gonorrhea, it is strong presumptive evidence that the infection is gonorrheal. Other signs that are also confirmative of the gonorrheal origin are persistent leucorrhea, associated with a passive inflammation of the urethra, ducts of Skene, and Bartholin's glands; pointed condylomata; endometritis, salpingitis, oöphoritis, and perimetritis.

Treatment of Vaginitis.—In acute vaginitis the patient should be in bed at least four or five days. The diet should be light, and free from all meats and highly seasoned dishes; tea, coffee, and alcoholic beverages are forbidden. The bowels should be regulated, and large quantities of water taken to render the urine bland and non-irritating. The urinary symptoms can be controlled by tincture hyoscyamus, etc. (see treatment of acute vulvitis). Rectal suppositories should never be introduced, and catheterization avoided in acute gonorrheal infection of the vulva or vagina, on account of the possibility of carrying the infection into the rectum or bladder.

In the acute stages, to keep the parts free of discharge, douches of boric acid (3 per cent), bicarbonate of soda (1 per cent), salt solution (1 per cent), or bichloride of mercury 1:5000, should be given every four hours. Sterile vulvar pads should be worn constantly, and changed and burnt as often as they are soiled. In the subacute or chronic stage the douches need only be given two or three times daily, depending upon the character and profuseness of the discharge, with one of the following solutions: Boric acid, 3 per cent; bichloride of mercury 1:2000; formalin 1:2000; permanganate of potash 1:500; permanganate of zinc 1:500; liq. cresol. comp. (U. P.) 1:100; creolin 1:100; mercurol, 2 per cent.

Douches to be most effective should be given as hot as can be borne, containing at least four quarts of fluid, at a temperature ranging from 110° to 125°, and administered in the recumbent posture, the patient being allowed to rest for one or two hours. Besides douches to keep the parts free of discharge, applications strong enough to destroy the microörganisms must be made directly to the infected mucous membrane. No drugs are more effective for this purpose than the various silver salts. They

not only destroy the gonococci directly, but bring about the desquamation of the epithelium containing the bacteria.

The method of making applications is as follows: After the acute symptoms have subsided (in about ten days or two weeks) the patient is placed in the dorsal position on the edge of a bed or table, in a good light. The vagina is distended by means of a Sims speculum. The walls of the vagina and cervix are carefully cleansed of all discharge with a douche of sterile water, and dried with pledgets of cotton held in a pair of uterine forceps. If the endometrium is involved, it is well to first make a thorough application of pure formalin with a cotton-wrapped probe (see paper later on "Gonorrheal Endometritis"). The vaginal wall and the vaginal portion of the cervix are now bathed in a 20-per-cent solution of silver nitrate. In doing this the greatest care must be exercised that the solution be thoroughly applied. In this way it is sometimes possible with a few applications to bring about a cure. Following the application, the excess of silver solution is mopped up, and a lamb's-wool tampon saturated either with a 25-per-cent solution of ichthyol in glycerin or a 25-per-cent ichthyol-vaselin ointment is left in for forty-eight hours. On removal of the tampon the douches are resumed, and at intervals of three or four days similarly medicated tampons are placed in for periods of twenty-four hours. If necessary, the silver application is repeated in ten to fourteen days, depending upon the condition of the vaginal walls.

Not frequently in chronic gonorrheal vaginitis the disease will be found to be confined to the fornices and the lower parts of the vagina, with an inflammation of the urethral orifice and Bartholin's glands. (For treatment, see vulvitis.)

Besides the preparations already mentioned, the following have also been found of service: Argyrol 10 to 25 per cent, protargol 10 per cent, mercurol 2 per cent, and ichthyol 25 to 50 per cent. The application can be made directly or through the medium of tampons, pencils, and vaginal suppositories.

Robert Asch (*Centralblatt für Gynäkologie,* No. 12) has been highly successful in the treatment of gonorrheal urethritis and vaginitis with paraiodoanisols (isoform). In vaginitis he uses a 10-per-cent ointment on tampons (in children, suppositories of 5- to 10-per-cent strength) every three or four days. In urethritis he instructs the patient to introduce pencils of the same strength into the urethra twice daily.

Yeast Treatment.—A few years ago, Landau of Berlin introduced this treatment with the idea that the rapid growth of the yeast would drive out the gonococcus by depriving it of food and water. Schiller (*American Journal of Obstetrics,* 1905, vol. 51, p. 635) treated ten patients with good results, there being no bad effect in any case, though some of the women complained of itching for several days.

The yeast used is best secured fresh from a brewery. After cleansing the vagina with sterile water, two teaspoonfuls of yeast and one teaspoonful of grape-sugar solution are introduced into the vagina through a speculum, in such a manner that the portio vaginalis and the walls of the vagina are bathed in it. If this can be done at the patient's home it is desirable. After the lapse of a few minutes a tampon saturated with grape-sugar solution is introduced, and after eight to ten hours a vaginal douche should be used. The treatment is repeated every twenty-four hours. The cases most suitable for the yeast treatment are especially the gonorrheal inflammations, both acute and chronic; cases of purulent vaginitis and endometritis which are not gonorrheal in character are also benefited (Kelly, Medical Gynecology).

In the milder forms of vaginitis, keeping the parts free from discharge by means of douches once or twice daily is all that is usually required. Occasionally the ulcerations in senile vaginitis require to be touched with a 10-per-cent nitrate of silver solution, followed by the introduction of a tampon covered with a soothing ointment to prevent adhesions.

True diphtheric vaginitis (Klebs-Loeffler bacillus), of which I have seen several cases, but always associated with a nasal or pharyngeal infection, disappears with the use of antitoxin and antiseptic douches.

Some time ago I treated a young woman who had suffered from girlhood with a persistent leucorrhea and hyperesthesia of the vulva, vagina, and cervix, in which the offending microörganism was found to be the pneumococcus. After the isolation of the microörganism she was successfully treated with douches and applications of 10- to 20-per-cent solutions of zinc sulphate.

Vulvovaginitis in children is an inflammation of the mucous membrane of the vulva and the vagina up to the cervix. With a few possible exceptions, when it is the result of lack of cleanliness or ascarides wandering in from the rectum, the inflammation is due to infection by the gonococcus. Its frequency, no doubt, is largely contributed to by the fact that the pavement epithelium in children, being soft and tender, and closer in its resemblance to the columnar epithelium, is more susceptible to the invasion of the gonococci.

Hamilton (*Journal of the American Medical Association,* vol. liv) reports having seen 344 cases of vulvovaginitis (in children ranging from three weeks to 12½ years) in the Vanderbilt Clinic in the past three years. Kelly cites an epidemic which occurred in the city of Posen in 1890, in which 236 schoolgirls, ranging from six to fourteen years, were infected—all having used the same public bath houses. Most cases of infection are no doubt the result of sleeping with some infected individual, although it may be acquired through the medium of linen, towels, sponges, etc. Only recently I saw a four-year-old child, who had become infected by using a public toilet on the Boardwalk at Atlantic City.

Symptoms: The onset of the disease is characterized by slight transitory swelling of the vulva. There is often, but not always, burning without frequent urination, and a thick purulent discharge. In the course of four to six weeks these symptoms disappear, yet from the occurrence of exacerbations, and by bacterioscopic examinations, cases not properly treated are found to be still infected months or even years afterward.

In the treatment of gonorrheal vulvovaginitis it cannot be impressed too strongly upon the parents the infectious and contagious character of the disease. No child should be considered positively cured, even when the discharge has disappeared, until after repeated bacterioscopic examinations have been made with negative results (once weekly for three weeks, and then a fourth examination after an interval of three weeks without treatment).

During the acute stage keep the child in bed, and irrigate the parts four times daily with a 3-per-cent solution of boric acid; later, with the lessening of the discharge, the number of irrigations can be reduced, and the stronger antiseptic solutions substituted. In the intervals the vulva should be covered with a pad and napkin. The pad should always be destroyed by fire as soon as removed.

Great stress should be laid upon the necessity of having the child sleep alone, having its own toilet articles, and all the linen used in connection with her boiled before washing.

Method of Administering Douches and Applications.—The child is placed in the dorsal position, with pelvis elevated. A medium-sized rubber catheter, connected with tubing of a fountain syringe, is introduced into the vagina. Two quarts of solution are used at each irrigation. Twice daily, following morning and evening irrigations, several drachms of argyrol (10- to 25-per-cent strength), or other silver solutions, are injected into the vagina, and applied to the surface of the vulva by means of a small syringe or atomizer. With the subsidence of the acute symptoms a 10-per-cent solution of silver nitrate is used weekly. This application causes little or no pain. Afterward the surfaces are carefully dried with cotton, and a pad applied to the vulva.

Irrigation: Any of the following solutions are useful: Boric acid 3 per cent,

bichloride of mercury 1:5000, formalin 1:2000, permanganate of potassium 1:200, mercurol 2 per cent, argyrol 10 to 25 per cent.

Applications and injections may be of silver nitrate 5 to 20 per cent, argyrol 10 to 25 per cent, protargol 1 to 10 per cent, collargyrol 1 to 5 per cent, isoform 1 to 5 per cent, ichthyol 5 to 20 per cent, and emulsion of bacillus Bulgaricus 10 to 50 per cent. In older children, with deflorated hymens, tampons saturated with ichthyol 20 to 50 per cent, or argyrol 10 to 25 per cent, may be placed in the vagina every two or three days; in younger children, pencils or suppositories are a preferable method of introducing the drugs.

Vaccine Therapy.—Despite the fact that in adults the serum therapy has been without positive results in the treatment of gonorrheal infections, the success obtained by Hamilton, Weinstein, and others in children undoubtedly justifies its use. Especially is this so when we consider the persistent care that is required to successfully treat this disease by the irrigation method. It not only shortens the time, but it is productive of better results. Hamilton's statistics show that by the irrigation method the average time in 260 cases was 10.1 months, and by the vaccine method in 84 cases 1.7 months. Weinstein (Landau's clinic, Berlin) reports 28 cases of vulvovaginitis cured by three to nine injections. Most of these cases had been unsuccessfully treated by other methods. Both Hamilton's and Weinstein's cases were bacterioscopically proven to be pure gonorrheal infections.

Hamilton used vaccine from the Rockefeller Institute, Presbyterian Hospital, and the other stock vaccines were prepared by Parke, Davis & Co., the strengths of which were 50,000,000, 100,000,000, and 5,000,000,000 killed bacteria to 1 Cc.

Injections were given into the gluteal regions. The number of injections necessary to produce a cure were from four to eighteen, depending upon the severity and character of the disease. Weekly injections were given for five weeks, then every ten days, until cured. The dosage should start with 50,000,000 and be increased 10,000,000 each time, until 100,000,000 is given. The patient should not be declared cured until five or six successive negative bacterioscopic examinations have been made. These examinations should be made weekly.

1900 CHESTNUT STREET.

GRAVES'S DISEASE.

MUMFORD, in an article contributed to the *Boston Medical and Surgical Journal* of June 2, 1910, presents this summary:

1. Graves's disease is due to abnormal activity of the thyroid gland.

2. In advanced Graves's disease, degenerative changes in the thyroid gland may lead to a shifting symptom-complex, ending at last in the positive signs of myxedema.

3. The histology of the gland in Graves's disease indicates shifting, advancing, and retrograding symptoms.

4. An enlarged thymus is nearly always found post mortem in patients dead of Graves's disease.

5. Advanced Graves's disease may exist without the presence of all the classical symptoms.

6. Graves's disease can nearly always be cured if taken early.

7. The sera of Rogers and Beebe cure a goodly percentage of cases.

8. Through hydrobromate of quinine (neutral), as used by Forchheimer and by Jackson, we find a great percentage of improvements and of cures. It is a pity so few cases have been reported.

9. The great and increasing experience of qualified operators is showing that more than 70 per cent of Graves's disease patients are now being cured by partial thyroidectomy, and the percentage of such cures is rising.

10. Treat the cases seen early by rest, by sera, and by hydrobromate of quinine; if no improvement results in two months, operate by thyroidectomy, and always regard the operation as the surest cure.

EDITORIAL.

IS PAIN RELIEVED BY THE APPLICATION OF DRUGS TO THE SKIN?

Probably since the dawn of medicine it has been the custom of medical men, and laymen as well, to treat localized painful affections by external applications, medicated or otherwise, and the opinion is universally held that much relief can be obtained by such measures. In these days of what may be called "therapeutic agnosticism," when old-fashioned therapeutic measures must stand the test of scientific investigation, there now and again appears a paper which seemingly proves that some of our most cherished measures are utterly futile. A paper of this nature appears in the *British Medical Journal* of March 5, 1910, upon the "Action of Cutaneous Anesthetics," by Short and Salisbury, in which they endeavor to determine whether the various drugs applied to the unbroken skin, with a view to the relief of pain, have the action attributed to them when used in liniments, lotions, or other external forms of application. They tested belladonna liniment, belladonna plaster, belladonna ointment, atropine ointment, the ointment of galls and opium, opium liniment, aconite liniment, aconitine ointment, and cocaine ointment, and they assert that none of these have any anesthetic effect on the unbroken skin. Nor are they content with this iconoclastic statement, but, continuing, assert that the time-honored custom of giving opium or belladonna suppositories after operations on the rectum is founded upon a misconception, since any effect which may follow is due to the general action of the drug, and not to its local influence. They even go so far as to state that there is no drug save ethyl chloride, which acts by freezing, which is capable of acting as an anesthetic on the unbroken skin, even including in this statement phenol, or carbolic acid.

Space does not permit of a thorough discussion of their various methods of testing tactile, thermic, and pain sense. Suffice it to state that their methods seem quite adequate, and do not appear to be open to radical criticism. They extended their research to the influence of drugs upon mucous membranes as well as upon the skin, and practically conclude that aside from cocaine and nearly-related drugs, other remedies possess no anesthetizing power upon these tissues. Using different solutions of atropine of different strength and ointments of different percentage they failed to find that this drug in any way produced effects which could be considered in the slightest degree as local. Even when they used a 3-per-cent solution of aconitine in absolute alcohol—a preparation far too strong for general use—they found that no local anesthesia of the skin developel; and further, they claim that the application of 0.5 solution of aconitine on the tongue produced no anesthesia, but only the characteristic tingling so well known as a prominent symptom in cases of aconite poisoning. When we remember that as a result of their research they believe that lead-water and laudanum is valueless as a pain-relieving agent, and that the dropping of laudanum in the ear is also useless, unless it is absorbed into the general system, it will be perceived that they are breaking the idols of many practitioners. Their assertion that carbolic acid, which has a reputation as a local anesthetic, and which certainly makes the fingers feel numb after being immersed in a solution of 1 to 20, possesses no anesthetic value is contradictory of ordinary belief. Indeed, they believe that the various forms of painful stimuli which they applied to their fingers after exposing them to carbolic acid showed the presence of a hyperesthesia rather than an anesthesia. We have known all along that cocaine is valueless as a local anesthetic if the skin is unbroken, and their experiments confirm this well-recognized fact.

The results which Short and Salisbury obtained as to the influence of menthol,

which is rated all over the world as possessing some benumbing influence upon sensory nerves in the skin, are interesting, for they did not find that it is a reliable local anesthetic. It does produce a counter-irritant effect, but does not paralyze nerve-endings, and when rubbed into the skin in saturated alcoholic solution they found that it had no power to alter the thermic, tactile, or pain senses. When it was rubbed upon the tongue it abolished taste, but the other senses were not impaired. Probably the sense of burning or the sense of cold produced by the local application of menthol simply masks other sensations which otherwise would be clearly recognized.

A very interesting observation of Short and Salisbury concerning the influence of menthol is to the effect that it apparently produces an actual decrease in local temperature. Employing a thermometer especially devised for the purpose, it being so sensitive that it measured the skin temperature over an inflamed patch of eczema as 0.4° centigrade higher than over the normal skin, they found that before rubbing on menthol the temperature recorded on the healthy skin was 32.3° centigrade, whereas afterward it was 31.6° centigrade—a very considerable fall. Short and Salisbury believe that menthol is the active agent in producing a part of this fall, but their experiments seem to prove to some extent the correctness of a contrary view, because, if alcohol is rubbed on one patch of skin, and menthol dissolved in alcohol on another, the reduction of temperature is the same. On the other hand, menthol dissolved in olive oil, which, of course, does not lower skin temperature by evaporation, reduces the temperature of the part more than if olive oil alone is used.

These investigators, therefore, come to the following conclusions, which, however well founded they may be from their experiments, will, we think, not materially diminish the use of ointments, lotions, plasters, and liniments, namely: that the use of belladonna, opium, aconite, and cocaine for bruises, thrombosis, inflammation, or neuralgia should be discontinued and replaced by more efficacious means, such as rest, massage, and counter-irritation.

Most persons have believed for many years that a large amount of the good done by plasters and liniments depends upon their counter-irritant effect, or upon the massage which is given in conjunction with the use of liniments, and it is probably true that this massage, with the liniment as a lubricant, is the real cause of the benefit which follows the employment of these preparations. In other words, the proper conclusion to reach is not that liniments and plasters are useless, but rather that they do good in another manner from that which has been commonly held in the past.

LITHIA WATERS AS THERAPEUTIC AGENTS.

The extraordinary vogue of the "uric acid diathesis" which for a number of years enthralled the medical profession and more recently has been universally accepted by the laity is, we are glad to say, rapidly diminishing among both classes, it being more and more clearly understood that uric acid in itself is not the harmful agent that it is supposed to be by Haig and his few enthusiastic followers. It is rather the intermediary products between foodstuffs and uric acid which are responsible for many of the symptoms resulting from perverted metabolism. Because of the wide acceptance of the so-called "uric acid theory," various agents, having more or less affinity for uric acid in the test-tube, have been widely heralded as valuable drugs in combating many conditions of so-called lithemia. One of the most innocuous of these is lithium and its various salts, most people failing to understand that although this substance unites with uric acid in the test-tube, it has a greater affinity for the acid sodium phosphate of the blood than it does for uric acid when it is taken into the body. The very large doses of lithia salts sometimes ingested by so-called gouty patients are responsible for some of the circulatory depression from which these cases

suffer at times, and they not infrequently impair the digestive functions. The so-called lithia waters found under various names upon the market probably do more good than does the administration of lithium by itself, for although their administration results in the ingestion of very small quantities of lithium so that no harm is done, the patient is encouraged to drink largely of water which is otherwise pure, which serves to flood the kidneys and provide the body with the necessary amount of fluid. This is the more advantageous in view of the fact that many of these patients drink very little water, relying in large part upon wines, coffee, and tea for their supply of liquid.

Attention has been called to this matter in the *Monthly Cyclopedia and Medical Bulletin* of March 10 by Dr. Henry Leffmann. As he well says, the quantity of lithium which is present in most lithia waters is so small that an attempt to use any of them for the therapeutic action of lithium would be on the same basis as the administration of cod-liver oil for the minute amount of iodine which it contains.

THE INFLUENCE OF DRUGS UPON PHAGOCYTOSIS.

The study of the influence of drugs upon the phagocytes, or those corpuscles whose function it is to devour invading micro-organisms, has progressed so little that we have almost no information concerning this important question. Readers of the THERAPEUTIC GAZETTE will recall that about a year ago we called attention to the studies of Mainwaring and Ruh upon the influence of quinine upon the phagocytes, wherein these investigators and others seemed to prove that small doses of quinine increased phagocytic activity, whereas large doses caused its arrest. In the London *Lancet* of February 26, 1910, Reynolds, who is a captain in the Indian Medical Service in the Punjab, reports some experiments upon the influence of opium and morphine upon the phagocytes, and quotes some other experiments performed as long ago as 1898 by Cantacuzene. This latter investigator found that opium inhibited the out-wandering of white cells and that it seemed to distinctly enfeeble these bodies, so that when they surrounded cholera microörganisms they fell victims to the invader instead of being successful destroyers of the pathogenic microörganisms.

Reynolds's experiments are too few in number, we think, to justify the conclusions at which he arrives, but they are interesting because they traverse a comparatively untilled field and because of the results which he obtained. According to his investigations morphine very distinctly diminishes phagocytic activity, the white cells which contain organisms numbering only 89 when morphine was given, as compared to 168 when no morphine was given. This experiment was made upon a guinea-pig. In the case of a dog the leucocytes which contained organisms before morphine was 123; half an hour after morphine was given, 64; and one and a half hours afterward only 29. A third experiment made with the guinea-pig gave results which were even more notable. He also attempted to discover whether morphine itself had any power over staphylococcus aureus, and found that it seemed to be without influence. Reynolds concludes that these facts indicate that morphine administered in the presence of acute infectious processes, as, for example, appendicitis, not only does harm in that it masks the symptoms and locks up the bowels, but also does harm by diminishing one of the important means by which the system combats invading micro-organisms.

SURGICAL TREATMENT OF GASTROPTOSIS.

There has never been exhibited by surgeons the same enthusiasm for securing in place by suture a prolapsed stomach as was shown at the time when the suture of a palpable kidney was a popular procedure, although in so far as the few reported results are concerned the effect of gastric suture has been quite as beneficial as has

been that of nephropexy. In so far as prolapse of the intra-abdominal viscera is concerned, the great majority of surgeons look upon the operative effort of suspension as at least a waste of time and attribute the beneficial results following such an operation to either the mental impression or to prolonged rest in the recumbent position.

Eve (*British Medical Journal,* May 7, 1910), basing his study upon an analysis of twenty cases, with special reference to operative treatment, believes that gastroptosis is usually accompanied by severe chronic dyspepsia often of many years' standing, flatulent distention, a sense of fulness and pain after food referred to the epigastrium, and sometimes radiating under the right costal margin and to the scapula. Vomiting is often present, and in exceptional cases is incessant. The symptoms may be more or less persistent, but commonly the sufferer is subject to periodic attacks or exacerbations of the symptoms which led to admission to hospital on several separate occasions. The pain is made worse by standing or walking about after a meal. During the exacerbations there is in some cases superficial and deep tenderness over the epigastrium; frequently hematemesis, which was present in half of the cases reported by Eve. In some cases it was copious, in others recurrently present. It is stated that in the course of the malady the stomach may become dilated. The position of the stomach is recognized by the fulness at and just below the umbilical region, flattening of the epigastrium, and by palpation and percussion, with or without inflation. In well-marked cases the pancreas is easily felt above the lesser curvature. It may be noted that gastroptosis may be overlooked and mistaken for dilatation of the stomach owing to prolongation downward of the free edge of the left lobe of the liver.

As to treatment Eve believes that this should in the main be surgical, except in those cases occurring after repeated pregnancies, when an abdominal support will prove efficient. The operation is thus performed: A sand-bag is placed beneath the lower part of the thorax as for operation on the liver; the abdomen is opened to the left of the middle line, and the liver well raised and held up by an assistant, the lesser omentum being thus fully exposed. If the thorax is very long and narrow a head lamp is advisable. The stomach is suspended by four or five interrupted silk sutures passed above through the upper part of the gastrohepatic omentum and below through the lesser curvature.

Advantage is taken of the fact that the gastrohepatic omentum close to its attachment to the diaphragm and transverse fissure of the liver is much thicker than lower down near its attachment to the stomach; but if the whole membrane is equally thin the sutures are passed above through the liver substance itself, just anterior to the transverse fissure. This is rarely necessary. Below, the sutures are carried through the serous and muscular coats of the stomach just in front of the attachment of the lesser omentum. The suture furthest on the right is not placed quite up to the pylorus, thus allowing the pyloric end of the lesser curvature to be on a slightly lower level than the portion on the cardiac side when the sutures are tied. A very long needle-holder is required in passing the sutures above under the diaphragm.

In cases of gastroptosis in which the stomach showed considerable dilatation atony and in which repeated hematemesis existed, gastrojejunostomy was performed. Of seven cases of gastroptosis in which the results of suture might be fairly judged, six were completely cured. Of seven cases treated by gastrojejunostomy, four were cured. In no instance was there recurrence of hematemesis.

Hutchinson commenting upon this same topic—*i.e.*, gastroptosis—points out that the affection is not really in itself a disease, and in many cases calls for no special treatment. Indeed, he goes further than this, and states that under no circumstances does mere displacement of the stomach considered by itself call for operation. Dyspepsia accompanying gastroptosis is regarded as in the main the result of a condition of the

nervous system, since such patients are usually neurasthenics. The functional disturbance generally assumes the form of impairment of gastric tone and an overproduction of acid; or rarely there is hypochylia. The first treatment should be devoted to the neurasthenic state, and for this the Weir Mitchell method is commended.

As to the treatment of the functional disturbance of the stomach which may be present, physostigmine is commended as a drug likely to be helpful, also strychnine; free administration of fats when there is oversecretion; judicious use of bismuth and the earthy carbonates. The bromides are also of service here. When there is diminished secretion or achylia, the amount of meat must be lessened; hydrochloric acid and acidol are indicated.

For the treatment of hyperesthesia poultices or fomentations are serviceable; whenever there is a general hypogastric tenderness such means may be usefully employed during the first week of the rest cure. Gastric sedatives, such as bismuth, bromides, chloroform, and even, in extreme cases, opium, are also useful. It has also been pointed out that the relief of these symptoms is obtained by providing some form of abdominal support. The best belt is a firm abdominal wall, and hence our efforts should be directed to restoring the tone of the abdominal wall and to thickening it by the deposition of a substantial layer of subcutaneous and extraperitoneal fat.

ADOLESCENT HYPERTHYROIDISM.

The surgeon who sees only advanced cases of hyperthyroidism, and those as a rule which have resisted all forms of hygienic and medical treatment and have steadily progressed toward a fatal issue, little realizes the comparative frequency of this affection and its amenability to other than operative measures. Cross (*Long Island Medical Journal*, April, 1910) in discussing the subject notes that the remarkable blood supply of the thyroid indicates an active and necessary gland. Since it has no excretory duct its secretion must pass into the general circulation through the medium of the lymph vessels. We are ignorant of the manner in which this secretion affects the body at large and of its ultimate destination. It seems unlikely that metabolic toxins are brought in the circulating blood to the thyroid and there neutralized by the thyroid secretion, since the beneficial effects of thyroid feeding are noted even though functionating thyroid tissue is absent from the body. From the chemical standpoint it is found that only those thyroid compounds which contain iodine are specific. Thyroglobulin made up of a combination of iodothyrin with thyrogen is obtained almost entirely from the colloid material of the thyroid, though it may be found in the cellular tissue. Iodothyrin is extremely resistant to chemical and physical agents, contains 9.3 per cent iodine, and exhibits the same properties whether of animal or human origin. Hence glands from the lower animals are found efficient when administered to human beings.

The thyroid secretion has a selective influence on metabolism and is essential to animal growth. It also exhibits a specific influence on the nervous system, influencing the blood-vessels through the sympathetics. The skin, epithelial tissues, and bones are also influenced in their development. The chief effect is manifested in general body metabolism, nitrogen metabolism being promoted and yet wasteful metabolism being limited. Parathyroid secretion is definite as an antitoxic, altering metabolic products. That the effects of thyroid disturbance are under parathyroid influence is apparently indicated by Kocher's demonstration that the removal of both thyroid and parathyroid glands is less rapidly fatal than parathyroidectomy alone; that cachexia strumipriva is less pronounced if the parathyroids are removed as well as the thyroid; and that iodothyrin exerts a favorable influence after parathyroidectomy. Cross notes that while enlargement of the thyroid is usual in hyperthyroidism, it is not necessarily essen-

tial. The size of the gland is of minor importance compared to glandular activity. Indeed congenital goitre is not accompanied by hyperthyroidism, though the gland may be enormously enlarged. When it is simple goitre it usually exists without symptoms of hyperthyroidism—that is, in its early course. The disease is common in girls at puberty. There is a firm elastic swelling, which usually disappears under a change of drinking-water and the administration of iodine. Acute or subacute thyroiditis, often complicating infectious diseases and frequently suppurative, is rarely accompanied by hyperthyroidism.

The hyperemic thyroid common in girls at puberty is characterized by symmetrical enlargement, often by slight tremor, general nervousness, moderate anemia, and possibly demonstrable exophthalmos. The affection runs a brief course and disappears in the course of weeks or months under hygiene, rest from mental activity, and treatment directed toward the correction of the anemia. This variety of hyperthyroidism has been termed by the French "school goitre." Exophthalmic goitre, though rare in children, often develops about the age of twenty. It may follow acute infections, emotional disturbances, or pregnancy. Besides the three classical symptoms, enlargement of the thyroid, tachycardia, and exophthalmos, there is an increased oxygen consumption, emaciation, nitrogenous disintegration, polyuria, often diarrhea, increase of perspiration, at times slight irregular fever.

Medical treatment is based on rest and diet as full as possible, nerve and heart sedatives, ferruginous compounds, arsenic, quinine, the administration of thyreoidectin. In this latter agent it is stated we have a drug which offers temporary relief of the troublesome symptoms of goitre. There seems, however, no reason to expect that a permanent cure can be effected with such preparations. Roger and Beebe's cytolytic sera have given excellent results. They are given exclusively by hypodermic administration. The first injections are followed by much local irritation, not infrequently by general symptoms of malaise, increased nervousness, and acceleration of the pulse. The irritation symptoms persist for from twelve to twenty-four hours. Thereafter if the patient is to be benefited he will experience a distinct betterment. When medicinal means are unsuccessful and the symptoms are progressive, surgical treatment should be adopted before the heart has suffered irremediable degenerative changes. This surgical procedure consists in either ligation of vessels or thyroidectomy; the former often as a preliminary measure to the latter. The ligation seems especially applicable to cases of mild hyperthyroidism and those advanced cases in which the late degenerative changes have been so marked as to contraindicate any radical operative procedure.

Under this treatment there is a distinct percentage of absolute cures. Nearly all cases are distinctly bettered and the mortality is low.

Partial thyroidectomy, when conditions are favorable for its employment, is the method of choice. It is, of course, entirely inapplicable to late cases characterized by myxedema. The percentage of cure is larger than that from any other means of treatment, and the mortality with the better selection of cases is steadily decreasing.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF CERVICAL RIGIDITY IN OBSTETRICS.

In the *Boston Medical and Surgical Journal* of April 21, 1910, MASON states that in the treatment of cervical rigidity in the three following classes is to be considered:

1. Where the patient is not in labor, but ought to be delivered, great haste not being required. This indication occurs in heart lesions with broken compensation and in cases of toxemia of pregnancy, which include pernicious vomiting and the pre-eclamptic state. The patients who are delivered on account of pelvic deformity before they arrive at full term in order to secure a living baby should also be placed here. A similar class of cases exists in those women where there is a habitual death of the fetus at a certain stage of pregnancy, and delivery is carried out before this period is reached with the hope of obtaining a viable child. This treatment is advisable to save the life of the fetus in some instances of wasting organic disease, as diabetes and tuberculosis. Cases in this class include patients at all periods of pregnancy.

2. Where the patient is in labor and ought to be delivered, great haste not being required. In these cases the pains do not result in a softening of the cervix and a dilatation of the os, but the cervix remains rigid and the os undilated. The pains may be nagging and irregular, or they may be forcible and regular. Cases of antepartum bleeding in which there has been only a moderate loss of blood, as may occur in placenta previa and detachment of the placenta, should be included.

3. Where the patient is, or is not, in labor, but requires immediate delivery, as in cases of eclampsia, profuse antepartum hemorrhage, collapse due to cardiac disease, respiratory embarrassment or approaching exhaustion of either mother or child, presents a similar indication for delivery.

The author deals first with the treatment of Class 1, which includes the cases of premature induction of labor, in which great haste is not required. Any operative maneuver may well be preceded by a long hot bath, followed by a copious vaginal douche of hot sterile water. It is not to be expected that uterine pains will be initiated as a result of these measures, although in occasional instances this does occur. Cervical relaxation, however, is apt to result and dilatation is made easier.

A low rupture of the membranes may be performed. This method is objectionable because it is uncertain in its results, labor starting up from a few hours to several days or even weeks later. In case there is a considerable delay before the advent of pains, the risk of infection, by no means slight, is present. Owing to the gradual leaking away of the liquor amnii, the uterus may shut down tightly upon the fetus and tonic spasm of the uterine muscle develop. There is the further disadvantage of the loss of the hydrostatic wedge when labor occurs. This objection can be theoretically met by performing a high rupture of the membranes, but this is difficult to do and is equally uncertain in its action.

The result of the introduction of bougies is likewise uncertain, and many women do not respond at all to this form of uterine stimulation. A catheter should never be employed, for it may perforate a uterine sinus, and, being hollow, air may enter and embolism may result.

Packing the vagina with plain sterile gauze may be followed by labor a few hours later, but the method is unreliable, and it may be carried out with no result. In case a vaginal pack is employed, it should be a tight one, and should be changed at least every twenty-four, and better, every twelve, hours. A similar but better method, as it is more likely to be efficacious in its result, is to pack the lower uterine segment with gauze. Labor usually starts up a few hours later. In order to carry out this procedure, the cervix should

be well exposed by placing the patient in the dorsal position, depressing the perineum and attaching a double hook to the anterior lip. Where we have to deal with a primigravida, it is almost always necessary to carry out a slight preliminary dilatation under ether with the metal branched dilator. In the case of a multigravida with a patulous os, the lower uterine segment can then ordinarily be easily packed through the cervical canal by means of a long forceps carrying a narrow strip of gauze. This may be done usually without any preliminary dilatation of the cervix, and if dilatation is necessary, it can generally be carried out with the fingers and without anesthesia. As much packing as possible should be inserted, taking great care not to rupture the membranes. Packing of the lower uterine segment should always be followed by a vaginal pack, and this should be carried about the cervix so as to surround it and bury it in the roof of the vagina. The entire vagina should be tightly filled. By means of this method labor may be started up after the insertion of a single pack, but it is more often necessary to change it several times, and occasionally no result at all is produced. Repeated packing of the vagina and lower uterine segment with gauze is always attended by the risk of infection.

The best method of inducing labor is by the use of an elastic dilating bag, for it is the most certain, the cleanest, and the safest. There are several kinds of bags, of which the most commonly used are the Champetier de Ribes balloons, Barnes's fiddle bags, Pomeroy's bags, and Voorhees's bags. The Champetier de Ribes balloon is perishable, difficult to sterilize, and expensive. Owing to its large size it is necessary to obtain considerable dilatation of the internal os before it can be inserted, and the introduction and filling of the bag necessitate pushing the head up above the pelvic brim. Barnes's bag is also fragile and can rarely be sterilized and used more than once. Owing to its shape, having a constricted area in the middle to lie opposite to the internal os, and because of its frail composition, only a slight dilating force can be exerted by it. Pomeroy's bag is a device for dilating both the vagina and the cervix, for when distended with fluid it exerts pressure upon both. The Voorhees bag is the best kind in every respect; it is conical in shape and composed of rubber fiber, which makes it very durable. The following description of the use of the Voorhees bags was obtained from a personal interview by the writer with Dr. Howard T. Swain, who has had an extensive experience with them: The patient with an empty bladder and rectum is placed in the dorsal position, and is prepared as for an operative delivery. It is generally necessary to etherize a primigravida, but with a multigravida an anesthetic is not necessary. The cervix is exposed by means of a Garrigues weighted speculum, and a firm grasp of the anterior cervical lip is made with the double hook, the cervix being pulled down as near to the outlet of the vagina as possible. If there is insufficient or no dilatation, then the cervix is gently stretched with a branched steel dilator to the requisite size to admit the insertion of the bag. The bag of the desired size, the largest which can be used, having been boiled for two minutes, should be taken and drawn out to its greatest length, folded snugly upon itself and pressed firmly by the fingers, thus expelling the contained air. The tube is followed down by the fingers for the same purpose and the end is clamped by a snap. A long curved clamp is gently locked upon the bag, the tip of the clamp extending exactly to the end of the bag, and the bag is then carried through the cervical canal up into the uterus by means of the clamp. Great care should be taken not to allow the bag to touch the vagina in its passage through it. When the bag is in place, the clamp is carefully unlocked and a large metal syringe, the contents of which are equal to the contents of the bag, is filled with warm sterile water or salt solution, its tip attached to the end of the tube, and the bag gradually distended with the fluid. When the bag is partially filled, the clamp is gently with-

drawn. Unless the precaution is taken of first injecting some fluid into the bag, the removal of the clamp is quite likely to bring out the bag at the same time. When the bag is completely filled, the syringe is removed, the end of the tube is doubled upon itself and tied firmly with narrow tape or bobbin. Traction should then be exerted upon the tube to engage the bag in the cervix. The tube is covered with a pad of sterile gauze, placed in the vagina, and left. Where a rapid result is desired, a weight may be attached to the tube and allowed to hang over the edge of the bed in order to bring a constant traction against the cervix, but this is unnecessary and the procedure is not a clean one.

The most scrupulous asepsis must be employed in the use of the bag. A proper care of the bags is essential in order to preserve them. After using they should be thoroughly scrubbed with soap and water. They should be dried with a cloth and not by heat, for the latter injures them, causing them to dry and crack. The interior should be dried by inflating them several times every few minutes, which prevents their sticking together.

The effect of the bag is most gratifying in the class of cases in which it is desired to start up labor. Pains may commence at once, but they are more likely not to begin for several hours, and rarely a day may elapse before the advent of labor. The pains are apt to be strong from the first, owing to the stimulus of the foreign body within the uterus, and dilatation ordinarily advances rapidly. As soon as there is sufficient dilatation to allow the distended bag to pass it is extruded from the cervix, and on examination will be found lying in the vagina.

DRUGS IN CONSTIPATION.

In the *Practitioner* for May, 1910, WILKINSON says that although materia medica has lost its importance in the armamentarium of the physician, pharmacology must be retained by those who use drugs. It would be well if the effects of drugs were more thoroughly understood by those who use them so casually. Drugs have a specific affinity for certain tissues—a clinical fact which Ehrlich's brilliant hypothesis explains so simply—and when we desire to obtain one effect, we must remember also that few drugs affect one tissue or organ exclusively. This is especially true of purgative drugs. Some of them, as calomel, cascara, rhubarb, castor oil, affect the whole intestinal tract; others, again, affect chiefly the large bowel. Many aperients also stimulate the liver—*e.g.*, calomel, aloin, rhubarb, podophyllin, sulphate of soda. No doubt some drugs act on the pancreas, and perhaps the suprarenals, which are related to the nervous apparatus of the bowel. Certainly the pancreatic juice acts upon some drugs, notably castor oil. More important still, almost all purgatives in large doses are in part absorbed, and passing into the circulation may seriously injure internal organs, especially the kidneys. This risk is greatly increased when the drug is given subcutaneously. Calomel and the glucosides, as a class, thus irritate the kidneys when they are injected subcutaneously, while their purgative effect is mainly lost. An attractive and tasty form of aperient, phenolphthalein, has the decided objection that one or two doses may be effective and harmless, but if repeated often may irritate the kidneys and also induce catarrh of the bowel. Such drugs are best left alone. Furthermore, in women purgatives may act powerfully upon the uterus, causing pain, increased hemorrhage during menstruation, and even abortion in pregnant women. Of course, in states of prostration, collapse, or great weakness, purgatives may actually precipitate or cause death. Phenolphthalein (3 to 5 grains) in tablets has been recommended. But the older drugs are safer—senna, rhubarb, cascara, aloin, and, for stronger effects, jalap, podophyllin, colocynthin. The old-fashioned freshly-made senna tea flavored with some fruit juice or syrup is a good preparation. Excellent also is the compound licorice powder (1 to 2 drachms), both for occasional and habitual constipation, especially in lead colic and

chronic forms of obstruction. Cathartin (1 to 3 grains) is useful and causes the bowels to act in eight to ten hours, but the drug is not always what it should be.

Rhubarb is even better than senna, as it is not so nauseating. Rhubarb and soda need no recommendation.

Cascara sagrada, especially the tasteless fluid extract, with equal parts of glycerin and a few drops of nux vomica tincture, is very useful in the chronic constipation of women at all times. Aloin (¼ to 1 grain) is a stronger drug and may act injuriously upon the kidneys and uterus, and also upon the intestine, especially the large bowel. It is therefore avoided when there is any tendency to piles. Jalap, podophyllin, colocynthin, and citrullin may have their uses in severe forms of constipation. Colocynthin and citrullin (1/50 grain) are used in suppository form. They are hardly to be used in habitual constipation. Chemical bodies, such as sulphur and mercury salts, and mineral waters (Hunyadi Janos, Rubinat, Friedrichshall, Abilena, Pullna), containing proportions of sulphates of soda and magnesia, are valuable in proper cases. The waters are taken hot, early in the morning, in order to secure relief after breakfast. The mineral waters may be well chosen for cases of constipation occurring in fat people, also when the action of the liver is at fault, even when piles exist; in catarrh of the stomach and bowels; and in order to restore healthy function to the organs of those who have lived "not wisely, but too well."

Lastly, jellies may give bulk to the food residues left after digestion, and thus help the action of the lower bowel. Regulin, which is composed of our old friend of the bacteriological laboratory, agar-agar, containing 20 per cent of cascara, is a safe preparation, but not always effective. Still, it is useful in some cases of chronic constipation in advanced life. Large doses—half an ounce or more—are necessary. In all forms of constipation drugs are used, and may be useful, but not always purgatives.

Constipation may be due to widely different causes, and the choice of the drug, the dose, and the duration of its use depend largely upon the cause.

Thus, if spasm or obstruction be the cause, purgatives which increase spasm and peristalsis are out of court. After all, constipation is not a disease, but a symptom, which arises when the rhythmic, usually daily, evacuation of the bowel fails. The severest and gravest form is absolute constipation, when neither feces nor flatus can be expelled—a striking symptom in all forms of intestinal obstruction, including intussusception, volvulus, and occasional cases of appendicitis, and occurring, too, after abdominal operations, including even operations for appendicitis. In such states purgative drugs must never be used, since they cannot help the bowel to empty itself, and can only add gravity to very grave conditions. Fortunately purgatives, if taken by the mouth, in these states will generally be vomited. Once absolute constipation, indicating intestinal obstruction, is present, such drugs can at best merely irritate the intestinal walls, already in an actual or imminent state of spasm from overaction. Even in the less urgent and more chronic forms of obstruction, associated with stricture from various causes such as carcinoma, chronic intestinal tuberculosis, including the rare hypertrophic form, syphilis, etc., it is wise to avoid, as long as possible, the use of purgatives by the mouth.

In absolute constipation the only drug that eases the symptions and gives temporary respite by allaying spasm is opium or morphine, and when the diagnosis is clear —provided always that the lull of symptoms caused by the drug is not allowed to encourage any dangerous sense of false security—1/6 to ¼ grain of morphine in an adult, which may at most be repeated in four hours, will give infinite relief to the patient, and allow time also for the preparations necessary for active and immediate surgical interference. With these limitations morphine is the only drug to be thought of in absolute constipation. In

other forms of constipation, when spasm seems to check the natural action of the bowel, morphine may be of use. Thus in lead colic, when the spasm invades also the abdominal muscles and produces the hard, retracted (boat-shaped) abdomen, morphine may annul the spasm of the intestines and help evacuation. Such a purgative as compound licorice is thus helped to act. Sometimes, too, in intestinal colic, especially accompanied by much flatulence (windy spasm), morphine may be of use. Every one knows that a few drops of tincture of opium may be a useful addition to castor oil (in adults).

Both in men and women impacted feces may cause symptoms simulating those of intestinal obstruction. As a rule the differential diagnosis is possible, but the fecal mass may cause complete obstruction. Physical examination may reveal the doughy masses even of considerable size—suggesting tumors of the ovary, of the kidney or other part—and in the absence of the severe signs of intestinal obstruction a dose of calomel may do wonders. In more doubtful cases a large enema may be equally satisfactory. A large enema of soap and water or salt and water, or emulsions of various oils—sesame oil, olive oil, castor oil—can be readily introduced by siphon action when the patient is lying on the left side or in the knee-elbow position, or merely with the buttocks raised. An emulsion is rapidly made by dissolving a small piece of soda as big as a marble in ½ to 1 pint of water, and stirring up therein a few teaspoonfuls of any of these oils. The impacted feces soften and pass along the bowel. Similar expedients should always be tried in cases of acute intussusception in children. Salt and water is the best fluid, and the vessel containing it should be gradually raised to a height of two or three feet, and the condition controlled by palpation of the abdomen. But chloroform must be given both for diagnosis and treatment, and in the event of reduction failing, the surgeon should proceed at once to laparotomy.

THE TREATMENT OF ACUTE DYSENTERY BY A FIVE-PER-CENT SOLUTION OF NITRATE OF SILVER.

HEWES reports in the *Boston Medical and Surgical Journal* of April 21, 1910, on some cases treated by this method. A study of these records, under the régime of the nitrate of silver irrigation, shows that no protracted cases developed, the duration of all the cases being within the limits of that which is seen in the so-called mild cases of the disease. The average duration of the author's cases was ten days; the maximum duration, seen in one case, fourteen days.

The duration of dysentery under ordinary medical treatment, as stated, varies greatly:

Osler says that mild cases run a course of eight days, while severe cases rarely terminate within a month. Flint says the same.

In the epidemic of dysentery at Danvers in 1908, reported by Dr. Southard, the average duration of cases was twelve days. A considerable number of cases, however, ran a course of from three to six weeks. The mortality was 23.1 per cent. About half of the fatal cases were protracted ones.

If the practicing physician is asked to give his experience in regard to acute dysentery, he will say that it is a common thing for the disease, meaning the diarrhea and intestinal symptoms, to last from a month to six weeks.

Shiga gives the average duration of bacillary dysentery as forty days under ordinary treatment. The duration under vaccine treatment he gives as twenty-five days. By comparison it would appear from the records of the author that the nitrate of silver treatment of dysentery was more efficacious than ordinary methods of treatment in that protracted cases of the disease were less apt to develop under its use. This is a good evidence of the usefulness of the method. Its use does not necessarily effect the cure of mild cases; but it holds all cases within the limits of mild ones.

It may, of course, be that all these cases

of the author were foredoomed to be mild cases and would have arrived at spontaneous cure without the special treatment within practically the same period, and that no protracted cases would have been developed.

The author states he has not yet seen any protracted cases develop where this treatment was applied at an early stage of the disease.

The only control as to the greater efficacy of the treatment for the purpose described than that of ordinary medical treatment which the author can offer consists of the records of four cases of acute dysentery under his care during the same period which received the same medical treatment as the ten cases given in his first record minus the nitrate of silver irrigation. One of these ran as simple a course as any of the nitrate of silver cases. Two of them, which seemed in every way of the same type and severity as those included in the first record, showed signs of disease for twenty-five days or more.

He saw during the same period a number of cases of dysentery which had been treated outside for from one to three weeks and were still uncured. These do not, of course, form fair control cases. In some of these, in which apparently marked extension of the process had developed, the nitrate of silver irrigation begun at this late date did not appear to be of any special benefit.

In many of these late cases, however, which were dragging along with four or five mucous movements daily, the use of the method even at this late date appeared to hasten cure.

The details of the treatment used in this series of cases which the writer has reported are as follows:

The case when first seen was given a dose of magnesium sulphate. As soon as this drug had acted, irrigation by nitrate of silver was given. The rectal tube was inserted eight to twelve inches and a pint or more, according to the capacity of the patient to hold the solution, of 5-per-cent silver nitrate injected. The injection was retained by the patient as long as possible, up to a half-hour. Defecation was then allowed. Rectal injections of salt solution were given regularly after each movement during the course of treatment. A second injection of silver nitrate was as a rule given after a period of two days. In some cases one injection only was used.

A diet selected with the idea of reducing the amount of fecal food residue was given. The daily content of this diet was as follows: Lean meat, 300 grammes; three slices of toast with maple syrup; albumen water consisting of the white of eight eggs in water.

This was continued for five days. The diet was then increased by the addition of more toast, butter, tapioca, potato juice, rice, and macaroni.

THE TREATMENT OF ACUTE PYELITIS DUE TO BACILLUS COLI IN INFANCY.

McDONALD, writing in the *Quarterly Journal of Medicine* for April, 1910, states that the main indications are two. The first of these is to insure a copious discharge of urine, which is effected by giving fluids freely, by the mouth if possible, and if not, by the rectum (saline enemata).

The other, which is the most important, is to render the urine alkaline on passing, and to keep it so for a time. This is done by administering citrate of potash or some other alkaline remedy. The dose of the citrate which is required varies greatly in different cases. The smallest amount, the author states, that he has seen effectual is 24 grains in the day. He usually begins with 48 to 60 grains, and increases to 120, 150, or even 180 grains in the twenty-four hours, if the urine remains acid. The time it takes to make the urine neutral or alkaline also varies according to the doses of the medicine given and the severity of the case. The state of the bowels may have something to do with this, because if the citrate sets up profuse diarrhea, its effect on the urinary reaction is, of course, weak-

ened. Generally the urine becomes alkaline in four or five days; occasionally, in between one and three; and sometimes it takes six or seven days, but never more.

The best idea of the effect of the alkaline treatment on the cases can be obtained by looking at the temperature charts, because when the temperature falls the other symptoms always improve; and any recurrence of the other manifestations of the disease (such as increase of the pus, of the acidity of the urine, or of the general distress) is accompanied by a rise of temperature.

On studying the charts and records of other published cases as well as his own, certain generalizations seem justified:

1. When an alkali is not given, or is given in insufficient doses, the case may recover; but the course is apt to be very protracted. The risk of relapses and of extension of the disease to the kidney under these circumstances is probably considerable.

2. If the kidneys have become seriously affected by the time the treatment is begun, the alkali does not reduce the temperature, and neither it nor anything else seems to do any good.

3. When, in an uncomplicated case of acute pyelitis, an alkali has been given in sufficient amount to render the urine alkaline on passing, the temperature always falls to normal or nearly normal within a day or two at most. Along with this the general symptoms improve greatly, and the pus disappears from the urine, though a pure culture of bacillus coli may sometimes be got from it for weeks or even months after.

4. It is interesting to notice that, even if the alkali is pushed, there is generally a strong tendency for the urine to become acid again a few (3 to 7) days later, and with this, as already indicated, the temperature rises and the other symptoms return. In some cases this secondary rise of temperature is severe; in others it is slight. In others again, especially in those in which large doses of alkali have been given, it does not occur at all.

5. The author asserts he has never had any case of acute pyelitis in a young infant in which other organisms were found along with the bacillus coli. In cases of such mixed infection in older children, however, the use of citrate of potash in large doses has never seemed to do good, and usually has appeared to be positively harmful.

In addition to the free administration of fluids and the use of alkalies, it is advisable to keep the bowels open; and for this phosphate of soda is probably the best drug to use, because it tends to render the urine alkaline. An occasional dose of calomel is also beneficial.

Antiseptics of various kinds, especially salol and urotropin, have been often recommended in the treatment of pyelitis. When given apart from the alkaline treatment their action is unreliable and disappointing; and the symptoms tend to relapse repeatedly. Given in addition, the writer has several times thought that their use was followed by some improvement. Generally, however, in his experience, the improvement under citrate of potash, if it was given in sufficient doses, has been so steady and satisfactory that nothing else has been called for. For the same reason he has had practically no experience of bacteriotherapy in this disease. It has been tried by many observers with varying but often not very satisfactory results.

BLOTTING-PAPER MOLD FOR OBTAINING CRAYONS OF CARBONIC-ACID ICE.

TOUSEY in the *Journal of the American Medical Association* of May 7, 1910, in writing on the use of carbonic-acid snow reminds us that pure carbonic-acid gas which has been compressed into a liquid by enormous pressure evaporates so rapidly when liberated that a portion of the liquid freezes and takes the form of snow or ice, according to the conditions under which it is collected. Frozen carbonic acid has a temperature of about 85° F. below zero and freezes any animal surface to which it is applied, a certain amount of pressure being required. The effect is one of superficial

or deep destruction, according to the length of application, thirty seconds usually being a full exposure. Frozen carbonic acid has been successfully used in treating port-wine stains, a type of nevus for which no other treatment is even partially satisfactory. Other lesions for which it is excellent are lupus, warts, condylomata, moles, and epitheliomata.

The originality and simplicity of the method which the author here outlines are best shown by first describing two of the most popular previous methods.

In Gottheil's method a folded towel or a piece of chamois skin is applied to the vent in such a way as to be in sufficiently close contact with the orifice. He sometimes uses a cylindrical staff or short piece of broomstick to get a proper cavity in the towel, removing it after the first windings of the retaining bandage have been put on. With ordinary rollers this hollow towel or bandage is firmly bandaged to the vent and heavily reënforced. It is well to use plenty of bandage and to wind it tightly around the neck of the vent and top of the cylinder, for on this depends the amount of pressure that can be used without rupture or escape of gas and the hardening of the ice. With the key the gas is then turned on at the tap, slowly at first so as to permit the ice to freeze in the meshes of the container. Clouds of white vapor or fine snow escape; the cloth may rupture and the cylinder top is covered with hoar frost. The gas is then turned on again forcibly a number of times until a sufficiently large and firm mass of ice has formed. When this is obtained the cloth is icy cold and perfectly hard; the gas is then shut off and the bandage cut away. The ice cylinder and the cloths are frozen together, and the bandages are brittle and must be carefully disentangled to avoid tearing.

Pusey's method is to collect the snow in a cloth, or preferably a chamois skin, and subsequently to compress it into a solid mass with the hands protected by a cloth, and to pare into any desired shape with a knife or press it into a tubular mold.

Tousey's device consists in a hollow cylinder made by rolling several layers of blotting-paper around a lead-pencil or a glass vial, which is then removed. The blotting-paper must be absorbent all the way through, not sized on one side like so many advertising blotters. One end of the tube thus formed is tightly stoppered. The other end is placed tightly against the nozzle of the liquid carbonic-acid tank and wrapped around with adhesive plaster to make an air-tight joint.

The carbonic acid cylinder employed is a small one, 18 inches long and 4 inches in diameter, and containing 5 pounds of liquefied gas. It is laid on its side with the lateral nozzle turned downward. The liquid should be allowed to flow out into the porous paper tube. A portion immediately vaporizes and escapes through the meshes of the paper, producing cold enough to freeze the remainder. The liquid is allowed to flow very slowly, taking perhaps a minute to fill the tube. Turning it on full force would blow the tube off and waste a great deal of the liquid. When the mold is full of ice the liquid will begin to spurt out around the adhesive plaster, and the flow should then be turned off. The adhesive plaster being unwrapped, the porous paper cylinder will be found to contain a crayon of carbonic acid resembling very much the crayons used for writing on a blackboard. The blotting-paper may be unwrapped from one end of the crayon so as to expose the latter. Or after waiting a short time the crayon will be found to have lost some of its substance by direct evaporation and to lie loose in the blotting-paper tube. The crayon may be made to protrude as much as desired by holding the tube upside down with something to prevent the crayon falling out altogether. The blotting-paper is flexible enough and a sufficient non-conductor of heat to serve as a handle for the crayon, which must not be touched by the naked hand.

It is not practicable to secure ice crayons with the carbonic-acid cylinder in the upright position, because then only the gas

above the surface of the liquid could reach the nozzle and escape. None of the actual liquid would be let out of the tank in this way.

THE PRESENT-DAY TREATMENT OF SYPHILIS TESTED BY THE OCCURRENCE OF SYPHILITIC DISEASES OF THE NERVOUS SYSTEM.

The *New York State Journal of Medicine* in its issue of May, 1910, contains an article by COLLINS. This author believes that iodide of potassium is not an antisyphilitic agent in the strict sense of the term. There is no evidence that he has encountered to indicate that it has any destructive effect upon the spirochætæ. He is aware that there are certain cases in which the Wassermann test continues to give positive reaction until iodide of potassium has been added to the medication, but that does not prove that it is inimical to the life of the spirochætæ. Nor is he aware, he asserts, that satisfactory evidence has been offered to prove that antibodies appear under the use of iodide of potassium alone. Furthermore, he is of the opinion that not infrequently the use of iodide of potassium during the early stages of syphilis is deleterious in so much as it impairs the patient's vitality and interferes with that condition upon which the cure of syphilis is dependent—the reaction which takes place in the patient's tissues through the administration of the curative agency—mercury.

The other point that he wishes to make is that so long as it remains the custom, which it would seem is now well-nigh universal, to administer mercury by the mouth, we cannot hope to know whether or not a sufficient amount of mercury is absorbed to successfully combat the action of the spirochætæ and to annihilate them. The occurrence of ptyalism and other disturbances of the digestive tract is no indication that mercury is being taken in doses adequate to combat the disease. Many individuals present such indications of the toxic effects of the drug before any considerable quantity is taken. An idiosyncrasy to the drug or an intolerance of it does not signify that the system is impregnated, yet how often we find in the history of a given case that on the occurrence of such symptoms the amount of the drug was materially diminished or some other substance substituted for it. We cannot possibly know how much mercury is absorbed into the system unless we rub it through the skin or introduce it hypodermically. In that way alone can we judge how much mercury is being put into the system, and satisfy ourselves that an amount has been absorbed adequate to cure the disease or kill the spirochæta pallida.

The adequate treatment of syphilis is not the administration of so many grains of mercury and so many ounces of iodide of potassium, nor yet is it encompassed by "taking mercury for a year and potash for six months." It is encompassed by getting such sufficient amount of mercury into the system as will prevent the propagation of the specific organisms and the formation of the antibodies, and the way to tell if this is being accomplished is by the application of the Wassermann test. Not until we get repeated negative reactions are we justified in discontinuing mercurial treatment.

Finally, the individual who has syphilis is an important factor to consider if it is our ambition to cure syphilis and to prevent syphilitic nervous diseases. How many of them, even the most intelligent, appreciate that it is of vital importance to receive prolonged and oftentimes debilitating and distressing treatment? Now that we have a safe therapeutic test in the Wassermann reaction every patient should be imperatively urged to submit himself for such examination at least once a year for five years after he is discharged by his physician.

In conclusion the author states his belief, based upon his entire experience and the consideration which he has given to the disease and its sequelæ from a theoretical standpoint, that we shall be able materially to diminish the occurrence of syphilitic nervous diseases by advocating the use of mercury as a specific for syphilis and depre-

cating the use of iodide of potassium save as an absorbifacient of gummatous tissue.

It is no part of his purpose, the author asserts, to decry the therapeutic property of the salts of iodine. Were it so, he could marshal an array of facts to prove their injuriousness when given in comparatively small doses (40 to 60 grains a day) for a protracted time. He appreciates the therapeutic possibilities of the iodides, but is convinced that the therapy of organic nervous diseases, save gummatous formation upon and within the nervous system, would be more satisfactory if the salts of iodine were no longer in use.

THE CHOICE OF THE ANESTHETIC.

In a paper on this subject in the *Proceedings of the Royal Society of Medicine* for April, 1910, BUXTON tells us that the choice of an anesthetic depends on at least three important points: the condition of the patient, the necessities of the operation—which should include the region of the operation—and the duration of the operation. The safety of the patient must be paramount in the whole problem, not only during the period of induction and the period of maintenance of anesthesia, but also after the patient has come forth from the anesthetic and has to face the after-effects alike of the operation and the anesthetic, since these may be disadvantageous to him. For instance, in operations on the chest or on the abdomen it might be justifiable to employ ether; and yet if, after the operation, the patient is going to have such tight bandaging as to restrict the respiratory movements, and prevent the ejection of any accumulated fluid in the lungs, the pulmonary after-effects might show the choice of the anesthetic to have been faulty. Then we have to consider the patient from the point of view of normality and the degree of his departure from the normal. Many of us will feel that some of the old rules in vogue when we were commencing our work have now fallen into desuetude—such rules as those with regard to age, and the rules concerning method. We used to be told that ether should never be used below six years of age, and never after sixty. We were told that children took chloroform like mother's milk, and that they enjoyed a special dispensation granted by Providence which relieved them from the occurrence of dissolution whilst inhaling the drug. All belief in these things is now wiped away. We know that age is no absolute criterion in the choice of an anesthetic; we have to decide by individual physique and individual peculiarity rather than by age. Take, for example, an elderly man who, by the old rule, will be debarred from ether after the age of sixty. Some men of forty should be debarred from ether, because their arteries are degenerate, and they suffer from bronchial trouble, whereas many men over sixty are, except for their arteries, under forty.

The main point with regard to young children is this: they lose heat very rapidly, so that under an anesthetic, shock, which is practically loss of heat and failure of blood-pressure, is the chief peril. That is why it is inexpedient to give them ether unless precautions are taken to avoid loss of body heat. Ether is taken by young children very well for short operations if it is carefully given, but as the body temperature may be lowered from ½° to 3° F. very quickly, and that loss is very serious, we shall hesitate before giving ether to a very young child. Some years ago the author tested the effects of giving ether to young children, and the main points which struck him were the liability to salivation and bronchorrhea, which he regarded as not only distressing, but injurious to the children. Of course for very brief operations one would employ nitrous oxide or ethyl chloride. Dr. Flora Murray, a physician who has had much experience with children, has published a paper citing a considerable number of cases. She states that ethyl chloride, given in small doses, is very valuable for small operations. In dental work, especially for fidgety children, chloride of ethyl is valuable, although it is liable to cause nausea and even sickness.

In medium-aged children it is better to

continue the anesthetization with chloroform when surgical operations are in progress. For those who maintain anesthesia right through with one anesthetic, the author advocates a mixture which he now employs, rather than the A. C. E. or C. E.—viz., 1 in 10 alcohol and chloroform (Schäfer) by the open method. He employs chloroform *ab initio* when a regulating inhaler is used. It is very important in children, whose protoplasm is very susceptible to all drugs, to insist upon the use of low percentages, at all events during the period of maintenance, and avoid anything like asphyxiating complications. This, of course, would be effected by the employment of a regulating inhaler, especially if we employ oxygen *pari passu* with our chloroform. One cannot help being struck by the terrible mortality in young children during the operation of circumcision. Chloroform is commonly given, and children frequently die, and the author thinks they die because the reflexes are so very active in that operation that perhaps those who are less experienced push the anesthetic with the idea of abrogating all the reflexes, which, of course, is an impossibility. Therefore, with the exception of extremely young children—babes a few weeks old—he always employs ether for the induction of anesthesia in these cases, and goes on afterward with chloroform.

The routine anesthetic for youth and middle age is recognized as being nitrous-oxide gas, followed by ether. When we remember the very potent after-effects of ether, even if there are not nausea and vomiting, the writer thinks we have forced upon us the fact that the majority of people have more discomfort after ether than is at all necessary; this arises, he believes, because in the hands of the inexperienced too much ether is given. It is said that the employment of the open method will prevent this excessive dosage; but that is not the experience abroad, where the open method has been largely used and considerable quantities of ether employed, and where the remote after-effects are frequently prejudicial. So now, Buxton's practice is to confine ether to brief operations, even in middle life, and he follows it with chloroform; and practically always gives chloroform in association with oxygen so as to avoid all asphyxial complications.

DELIRIUM TREMENS.

PETTEY in the *Memphis Medical Monthly* for April, 1910, writes on this subject. According to the author the indications in the treatment are:

Support of the vital functions.

Control or arrest of delirium.

Removal of poison from the patient's blood.

In attempting to carry out these indications, the condition of the patient in all particulars must be carefully estimated. It will usually be found that the stomach is much deranged; that the fluids taken have either been vomited or have been but sparingly absorbed. Profuse perspiration is another symptom. This excessive leakage of the watery element of the blood from the pores of the skin, with the diminished intake or absorption of fluids, pathologically reduces the volume of the circulating medium. In well-developed cases the pulse is rapid and deficient in volume, the heart is working itself to exhaustion on an ineffectual volume of blood. The spleen is usually enlarged and there is a general venous stasis of the portal system. The functional activity of the digestive, secreting, and excreting organs is greatly diminished, if not entirely suspended. In many cases the mental excitement is so great as to attract and practically monopolize the entire supply of nerve energy, thereby depriving the eliminating organs of innervation to such an extent as to render them inactive. Our efforts should be directed to the restoration of the physiological distribution of both nerve energy and blood supply, as well as the elimination or dilution of the poison upon which the excitement depends.

For the purpose of treatment these cases should be divided into two principal classes —the hyperemic or sthenic type, and the anemic or asthenic type. In the first an

essential factor in the production of the delirium is a hyperemia of the brain. In this class all drugs which increase the blood supply to the brain increase the delirium. In these cases such drugs as strychnine, hyoscine, and morphine are not only harmful, but they are deadly. In the other class there is anemia of the brain, and the very drugs which are contraindicated in the hyperemic cases are the ones which give the best results in this class of cases; on the contrary, the bromides and other cerebral sedatives are hurtful. About 90 per cent of the cases coming under the author's care have been hyperemic and 10 per cent anemic. It is not always easy to classify them, but when in doubt the administration of a few full doses of gelseminine will usually enable one to do so. If the case is of the anemic type, the delirium will be increased by the effects of this remedy, but if it is of the hyperemic type the delirium will not be aggravated and may be markedly quieted. This test will usually furnish a clue to the proper class of therapeutic agents to be employed in combating delirium, but the administration of medicines alone is not to be depended upon. The plan of treatment which the author has devised is as much surgical as medical.

As above suggested, the volume of blood will be found to be much less than normal. This decrease occurs to a large extent because of the excessive leakage of the watery element of the blood through the pores of the skin, but the fluid thus escaping carries out with it only an insignificant quantity of the total accumulation of toxic matter.

The fact that the skin has not permitted any material quantity of these poisons to escape with the fluid, which formerly held them in solution, has left the blood a far more concentrated and toxic solution.

In normal salt solution we have a remedy with which this condition can be successfully combated. As a primary step in the treatment the author fills the colon with this solution, and repeats the same as often as it is absorbed, about every two hours; he does not depend upon the colon alone as a route by which to introduce this solution, but supplements it by hypodermoclysis, and in extreme cases by intravenous injection, the idea being to force fluids into the body until the entire arterial and venous systems are filled to their utmost capacity. The condition of the patient greatly improves upon the successful carrying out of even this step in the treatment. The heart, having an ample volume of fluid to handle, acts much less rapidly and propels a normal quantity of fluid with each contraction, as indicated by a more full, soft, and less rapid pulse.

The addition of this fluid to the concentrated solution of poison, of which the diminished volume of blood consisted, materially dilutes and renders less irritating the poison in the blood; it also in a very short time brings about free action of the kidneys, and thus one of the channels of elimination is opened up. As a rule, even this degree of dilution of the poison lessens the mental excitement and allows a more normal innervation of all the vital organs.

Elimination of the poison is essential to a cure, and the bowels and the kidneys are the organs upon which we must depend for that work; therefore, at the beginning of treatment, the author administers calomel in doses of three to five grains every hour, and continues until as much as four full doses have been retained. This calomel will not act as a purgative while the mental excitement continues to be so great, but it will be in the system ready to act when the condition of the nervous system has been so quieted as to permit it.

After the colon has been used for the purpose of absorbing saline solution for a few hours, it should then be brought into use as an eliminating organ. Full doses of Epsom salts should be given and repeated at frequent intervals until large quantities of liquid stools have been passed. The mental excitement does not retard the action of the saline cathartics as greatly as it does the action of cathartics of other classes. Their action is quite effective in this condition, as the watery discharges they induce drain out of the blood a large

quantity of the poison with which we are to contend.

After beginning the administration of the salts, the colon can no longer be used as a route by which saline solution can be introduced into the system, therefore one or both of the other methods should be continued, supplemented by free administration of water by the stomach, when that can be done, to the end that the system may be kept well supplied with fluids while it is necessary to drain the same out by the kidneys and bowels.

This practically amounts to washing the poison out of the blood by forcing fluid into it and draining it out by the natural channels. The quantity of poison eliminated by the skin is so small that it is hardly to be taken into account. Buchard has shown that the bile is about nine times as toxic as the urine, and that the urine is about fifty times as toxic as the fluids excreted by the skin. Doubtless other matter excreted by the bowels is fully as toxic as the bile.

The free administration of the normal salt solution so improves the heart action that it is often unnecessary to administer other agents for that purpose; still, as a further precaution, the author gives sparteine sulphate from the beginning of treatment until the patient is well on the road to convalescence. This is done for a double purpose. Sparteine is not only our most reliable heart tonic, but a good non-irritating diuretic. It increases the force and lessens the frequency of the heart's action, dilates the smaller arteries, especially the arterial capillaries, and aids greatly in restoration of circulatory equilibrium. Its action seems to be confined to the cardiac centers. It does not stimulate the central nervous system, as does strychnine and other remedies of that class, and does not increase the delirium. Its action as a diuretic is not well understood, but it is probably due to its power to improve the capillary circulation in the kidney. It should be given hypodermically, in doses of two grains at intervals of from two to six hours. Fractional grain doses of this remedy are entirely insufficient. It should be given in both the hyperemic and the anemic type of cases. It aids materially in meeting two of the indications in the treatment of this condition, that of supporting the heart and promoting elimination by the kidneys. It is, therefore, a remedy of the greatest value.

VACCINE THERAPY IN COLON BACILLUS INFECTION OF THE URINARY TRACT.

To the *New York State Journal of Medicine* for May, 1910, BILLINGS contributes a paper with this title. He says that patients suffering with pyelitis due to colon bacillus infection have recovered with autogenous vaccination when there was no obstruction to drainage.

Improvement may occur under the treatment in all, but entire recovery from the colon bacilluria will usually not occur if there is stagnation anywhere in the urinary tract. If the enlarged prostate is at fault, rational massage of that organ may be all that is necessary. If there be deformity of the pelvic organs or distortion of the kidney pelvis, or the existence of a urinary calculus, surgical interference should be instituted.

Systemic effects of urinary focal infection must not be overlooked. A chronic infectious arthritis, myocardial degeneration, so-called chronic muscular rheumatism, and neuritis may be related to the urinary infection. The resistant epithelial layer of the urinary tract probably prevents toxemia until long continuation of the infection causes injury of the epithelial layers, and then absorption of toxins may occur.

The bacilli isolated from cases of colon bacilluria differ from each other more or less in size, luxuriance of growth, etc. It would seem rational, therefore, to use autogenous vaccines. This is easily done. Cultures may be made from urine after it has been transported a thousand miles to a laboratory by one properly trained in bacteriological technique. He has had no experience with commercial stock vaccines,

and no comparison may be made of them here.

The autogenous vaccine may be made by heating the culture to 60° C. for thirty minutes. This has proved sufficient to kill the bacilli, as shown by control culture. Fresh suspensions of the dead bacilli should be used. Suspensions more than two weeks old may not give the same results. Usually the first vaccination is made with 200,000,000 bacilli. The subsequent dosage may be gradually increased until a decided local and general reaction occurs. The maximum dose in Billings's work was 1,000,000,000. Experience has proved that smaller doses are preferable to larger ones with some patients; 5,000,000 to 100,000,000 may produce sufficient reaction for curative purposes and diminish the risk of a too great reaction.

Absolute rest, much of the time in bed, with a copious fluid diet, chiefly milk, shortens the course of treatment, reduces the risk of chill with the reaction, and makes recovery more certain.

The specific effect of autogenous colon bacillus vaccine therapy is proved by the phenomenon of reaction. This consists of the local reaction at the point of injection, which includes redness of skin, tenderness and swelling over an area from one to two inches square. This begins in one or two hours after the injection, reaches the maximum in twelve to eighteen hours, and gradually disappears by the end of forty-eight to seventy-two hours.

A general reaction occurs in two to twelve hours—manifested by general malaise, aching of muscles, bones, and joints, more or less headache, and more or less fever, sometimes preceded by a chill and a leucocytosis. If the patient is up and about reaction is more severe—manifested by severe chill and fever. In many patients there is irritation—manifested by pain, aching, etc., of the kidney, bladder, joints, group of muscles, etc., which is respectively the seat of morbid change due to the colon infection. The specificity is further indicated by an increase in the opsonic index and finally by an immunity manifested by the failure of reaction after vaccination and the disappearance of the bacteria from the urine. One should employ at the same time all rational measures to relieve the patient—general hygiene, personal cleanliness, correction of diarrhea or constipation, hematinics when necessary and, as stated above, surgery or mechanical measures to correct anatomic faults which interfere with proper drainage of the urinary tract.

Billings believes that colon bacilluria is a not uncommon occurrence. In many individuals with this urinary infection there may be no perceptible effects from it. In other patients who suffer from some systemic infection, the conditions may be ascribed to the existing colon bacilluria without due regard for some other possible cause. This statement the writer thinks is necessary because he has found that colon infection of the urine has been brought into the foreground by some physicians who have known of pathologic effects due to it, and who may misinterpret the condition and fail to look for or to find a real focal infection somewhere else in the body. We must not forget that focal infection of the tonsils, of the sinuses of the head or of some other mucous tract of the body, may produce systemic disease. Therefore, while he believes that colon bacillus infection of the urinary tract is sometimes a cause of not only local but also systemic disease, he would caution those who find this infection of the urine not to be led astray by it, and to make sure of its relation to local or systemic evidence of disease by proof of its specificity by such tests as the agglutinative, phagocytic, bacteriolytic, etc., and at the same time to look for other possible sources of infection before the treatment is begun.

AGAR-AGAR TREATMENT OF CHRONIC CONSTIPATION.

GOMPERTZ in the *Practitioner* of May, 1910, says that his attention was attracted to agar-agar by a series of experiments by Prof. Lafayette B. Mendel, Yale University, designed to show that, whereas ordinary carbohydrates (starches and sugars)

are very perfectly utilized in the alimentary tract of man, a considerable number of carbohydrates, such as occur in many seaweeds, are not attacked by the digestive enzymes, and that the greater part was excreted in the feces unchanged.

Agar-agar, a simple carbohydrate, is taken from a seaweed. It has the property of absorbing water readily, and of retaining it, and as it is able to resist the action of intestinal bacteria, as well as the enzymes, its value in the treatment of chronic constipation was suggested to Professor Mendel. The earliest experiments of the author with agar-agar show that, when eaten as or with a food, it passes practically unaltered to the intestines, where it adds to the bulk of the feces, and, by keeping them uniformly moist, aids peristalsis; while further and continued experiments demonstrated and confirmed the fact that the hard and dry solidity is transformed into a condition of softer consistency, so that the intestinal contents develop their own agency necessary to produce a normal healthy evacuation.

Here, then, we could bring about a condition which approximates natural functions without the harmful and distressing effects of drug-taking. He was therefore encouraged to continue these experiments in the regular course of his practice, which he has pursued since with the most gratifying results.

The agar-agar used in the experiments of Mendel could be recovered easily from the stools. The effect on the total mass of feces passed was noteworthy. It was found that by its property of retaining water in the alimentary residue there was prevented the formation of the scybalous masses so characteristic of spastic constipation. It was this property of giving a soft consistency to the rectal contents, together with the resistance of agar-agar to bacterial decomposition, with the production of gases or other noxious products, which led to the suggestion of its use in the dietotherapy of constipation.

In order to test Mendel's theory clinically, the author has given agar-agar systematically (without the addition of any laxative) to patients suffering from chronic constipation in connection with the particular treatment which he thought the circumstances required; or has prescribed it independently for the relief that it affords.

Agar-agar comes in long strips, which are ground into small pieces resembling the consistency of a coarse granular cereal. The author orders it to be taken morning and evening, beginning with 15-gramme (½ ounce) doses, the amount to be increased or decreased to suit the individual case. It is usually eaten with milk or cream, the same as a modern uncooked breakfast food, with the addition of salt or sugar to make it palatable. It sometimes happens that when first taken the agar-agar becomes clogged in the rectum, and when this occurs a small enema of warm water will easily overcome the difficulty.

Among the first experiments of the author with agar-agar in all but two of thirty cases regular movements of the bowels had commenced after it had been taken from one to three days, and where the regularity of the bowels continued the agar-agar was gradually reduced. In a number of cases the patients had previously been unable to have a movement of the bowels without the aid of medicine.

THE INFLUENCE OF ALCOHOL ON TRAUMA.

DENNIS in the *New York Medical Journal* of May 28, 1910, asserts that the treatment of delirium tremens consists of a plan which has for its object:

1. The elimination of the toxemia.
2. The enforcement of sleep.
3. The administration of cardiac stimulants.
4. The maintenance of nutrition.
5. The alleviation of gastritis.
6. The necessary restraint.
7. The attention to atony of the bladder.
8. The cleansing of the oral and nasal cavities.

The elimination of the toxemia is best attained by a brisk purge, which must be a

drastic one to meet the indications. Calomel with jalap appears to be the best form of catharsis. Ten grains of calomel with twenty grains of compound powder of jalap will empty the alimentary canal freely and in a few copious movements. This powder should be followed in a few hours by a good saline. The high irrigation of a saline solution at the temperature of about 110° F. with a long flexible rubber tube will be a most valuable adjuvant, and should be repeated from time to time according to the indications. The kidneys must be called upon also to help in the elimination. With this in view large quantities of water can be taken if the stomach permits.

The enforcement of sleep is a most important point in the prophylaxis. Potassium bromide in 20-grain doses with doses of 1/100 of a grain of hyoscine hypodermically administered and repeated as often as is necessary after several hours, according to the condition of the pulse, seems to give the best results. The hyoscine is tasteless, and is given in such small bulk that it seems especially indicated where any violent manifestation is present. Chloral hydrate should be used with care, since many of the patients suffer from a fatty heart. Chloral in alcoholic cases produces the most natural sleep of all the narcotics, especially when combined with the bromides. The patients do not suffer from distressing dreams, and awake refreshed after several hours of sleep. The drug causes contraction of the pupils and a lowering of the bodily temperature, and must be used with judgment, since it is a cardiac depressant; it likewise produces a vasomotor paralysis, acts like a depressant to the motor tract of the spinal cord, and decreases reflex action. If the pulse is fairly good, chloral may be given in 10-grain doses with 20 grains of bromide, but usually the combination of bromide with hyoscine acts the best in the majority of cases, especially if there are any violent symptoms present. In all of these cases judgment must be exercised in the use of cardiac stimulants, especially in the aged.

Paraldehyde is a most important adjuvant, and should be given in two-drachm doses, as small doses do not produce sleep, but often excite the patient. Paraldehyde in two-drachm doses, to be repeated in a less sized dose after two hours, will eventually cause the patient to succumb to sleep, and is not likely to produce any cardiac disturbance. This remedy is best taken in an ounce of cold water. It must be remembered that in rare instances paraldehyde is incapable of producing sleep. It is, however, very rarely that this phenomenon occurs. Magendie's solution is used only when restlessness is extreme and cannot be controlled by the drugs mentioned above. The morphine is apt to cause suppression of urine and atony of the intestine with tympanites and later headache. For this reason morphine in only exceptional cases is to be employed.

Apomorphine has been used with success in a certain class of cases. A most interesting paper on the use of this drug in alcoholism has been published by Drs. Warren Coleman and John Metcalfe Polk, and the conclusions at which they arrive are quoted. The deductions have been drawn from an experience of some three hundred cases, and are so valuable that the writer desires to present them for the benefit of the profession.

1. To obtain a hypnotic action with apomorphine it should be given hypodermically.

2. The dose cannot be fixed. It is best to begin with a small dose, 1/30 grain, or less, and to repeat this or give a slightly larger dose within a short time. Further doses should not be given after vomiting occurs, until several hours have passed.

3. Doses, repeated in two or three hours, have but little beneficial effect.

4. The administration of apomorphine should not be repeated in patients who are weak.

5. The duration of the hypnotic action is only a few hours, and when the patient awakens his condition is practically unchanged, except in "ordinary drunks."

6. The best results are obtained from apomorphine when it is followed in two or

three hours by some recognized hypnotic, as bromide, chloral, paraldehyde, etc.

7. Solutions of apomorphine are unstable, and should be freshly made for use. Old solutions should never be used.

8. Apomorphine may be employed as a hypnotic in selected cases of alcoholism. The best results are obtained in "ordinary drunks" and in patients verging on delirium tremens. But in some of these patients the drug has no effect whatever.

9. The administration of apomorphine to patients in delirium tremens is without beneficial results, and may even be attended with danger from its depressing action.

This analysis represents in the main the results obtained with apomorphine in all the 300 patients presenting alcoholism to whom the drug was administered.

The administration of cardiac stimulants becomes an important feature in the treatment of these cases. Strychnine in 1/50-grain tablets, every six hours, either by mouth or hypodermically, is one of the best remedies to counteract the cardiac depression. If the kidneys are not diseased, fluid extract of digitalis in 3- to 5-minim doses, every six hours, is an excellent remedy. The authors have used ergotine with excellent results, and it seems to be a drug especially suited to these cases. The intense excitability of the spinal cord and the paresis of the vasomotor system point to the use of ergot as one of the best remedies to meet the twofold condition. The disturbance of the vascular system of the nerve centers and the paresis of the vasomotor system must be made normal in order to remove the distressing symptoms incident to the toxemia present in alcoholism. The cases in which ergotine has been used in 1/100-grain doses hypodermically two or three times a day for several weeks have been most satisfactory in the permanency of the cure in many cases, and the immediate relief of the distressing symptoms in nearly all of the cases of delirium tremens with the usual sequelæ. The administration of whisky for a few days to ward off an attack of delirium tremens has been severely criticized by medical men whose opinion is entitled to the highest respect. They argue, why continue whisky and add to the toxemia when its discontinuance and elimination are the great objects in view? The answer is that experience has taught in thousands of cases that a gradual diminution meets with the best success, and after a good night's sleep has been obtained then the whisky should be discontinued. During the onset and continuance of an attack of delirium tremens is not the time to try to reform the patient. When the alcohol has been all withdrawn, strychnine should be substituted, as this overcomes the tendency to cardiac weakness by the discontinuance of alcohol, and relieves the feeling of lassitude and depression. The administration of whisky in other words at this temporary critical juncture in the condition of the patient becomes a necessary evil, to be discontinued and dispensed with altogether as soon as the state of the patient makes it possible. Alcohol is the cause of delirium tremens, and this cannot have been continued a long time with its profound influence on the nervous system and be suddenly checked without serious disturbance. It is to bridge over this crisis only that its use is urged until sleep is obtained, after which the prohibition can be enforced. If whisky is ever eliminated in the prophylactic treatment it is only in the case of young people with good heart and kidneys; but not in the aged or feeble.

The maintenance of nutrition is another important point to consider. The presence of gastritis often prevents the inhibition of food on account of nausea and vomiting. The surgeon must bear in mind that the tendency of the alcoholic habit is to cause exhaustion, and for this reason it is imperative to begin and continue food as soon as the patient can tolerate it. Among the articles of diet milk and Vichy in small and oft-repeated doses are found to be most nutritious. Beef tea or broths are articles of diet to be highly recommended where milk cannot be taken. Some patients like the alternate use of these articles of diet. It is highly important to maintain the

strength of the patient, since the tendency of the disease is toward physical exhaustion. As soon as the patient can digest these articles of food, more nutritious diet in the form of eggs and chicken can be added. Buttermilk is an excellent form of nutrition in these cases, and sometimes kumiss is also used with advantage. The albumen of eggs in cold water to which has been added a little salt is a most excellent form of nutrition to be taken in small quantities at frequent intervals.

The alleviation of gastritis is another important element in the treatment of these cases of alcoholism following trauma. If the patient is in a condition to have the stomach washed out, lavage of that viscus with a three-per-cent solution of boric acid in hot water, to which is added a teaspoonful of bicarbonate of soda, is of great benefit; and if washing out the stomach is not practical, pancreatin in ten-grain doses combined with twenty grains of bicarbonate of soda forms a useful powder to overcome the nausea, or a powder, composed of five grains of cerium oxalate with ten grains of sodium bicarbonate, has been found to be as satisfactory as any of the remedies that have been suggested for the treatment of this form of gastritis. After the vomiting has ceased and the patient can take solid food, five to ten minims of tincture of nux vomica in a tablespoonful of water is a most valuable tonic to administer three times daily after eating. This is one of the best stomachic tonics to employ to improve the condition of the stomach. This tonic should be continued for a fortnight at least.

The physician must bear in mind also that the disease is one of exhaustion, and if the stomach will not tolerate food, rectal alimentation for a few days must be employed, or the rubber tube, to which a funnel can be attached, into which fluid diet can be poured. This form of feeding is often very difficult to carry out owing to the opposition of the patient.

The necessary restraint forms a feature in the management of alcoholism that deserves some special consideration. It must be laid down as a rule that the least restraint consistent with the safety of the patient is the best method to be employed. The use of wrist and ankle bands, or the application of a strait-jacket, or the exercise of force on the part of the attendants, has a deleterious effect on the patient, and often increases the delirium and excitability. As a rule, to which there are a few exceptions, these patients can be managed by persuasion and kindness, and even often humoring them in their delirium. Any violent action upon the part of the nurse only excites the patient, and makes him more intractable. These patients must, however, be carefully watched, since they are apt to rush out into danger owing to a delusion that they are persecuted. In hospitals where there are a number of patients it sometimes becomes necessary to resort to methods of restraint, but it is always to the disadvantage of the patient. The sheet is often used under the bedclothes and over the patient and fastened under the iron frame of the bed, so that the patient cannot get up, and this form of restraint in no way excites the patient, as he is not aware of its application.

THE IMPORTANCE OF BLOOD-PRESSURE IN THE TOXEMIA OF THE LATTER HALF OF PREGNANCY.

In the *New York Medical Journal* of June 11, 1910, HIRST contributes a paper on this topic. The conclusions he has reached in this matter are as follows:

1. The normal blood-pressure in normal, healthy, non-pregnant women will not vary much from 112 mm.

2. The normal blood-pressure in healthy pregnant women will average close to 118 mm. A slight increase over these figures is to be expected in the last month of pregnancy.

3. Blood-pressure in toxemia in the first half of pregnancy associated with pernicious vomiting is invariably low.

4. Blood-pressure in toxemia in the latter half of pregnancy, associated with albuminuria and eclampsia, is invariably high.

5. A high and rising blood-pressure is an invariable and early, often the earliest, sign of toxemia in the latter half of pregnancy.

6. Upon the rupture of the membranes, there is an immediate fall of pressure of from 60 to 90 mm. This fall is temporary only, but is attended with marked relief in the headache and epigastric pain these patients so frequently complain of. The relief from these symptoms lasts, however, for some hours after the pressure returns to near its original height, which it does shortly after the first fall. A similar fall, but much slighter, is noticed after a sweat bath.

7. There is a second fall of from 60 to 90 mm. after the child is born. This again is only temporary, and in from fifteen to thirty minutes, if a patient has not bled profusely, the pressure is back to somewhere near, but not quite to, its level before the birth.

8. Usually in eclampsia the pressure measures high for forty-eight hours after the birth, then begins to subside and reaches the normal of from 118 to 124 mm. in from seven to ten days after delivery.

9. As far as it is possible to lay down any rules in these cases, the author states that a blood-pressure of below 125 mm. could be disregarded; that a pressure of from 125 to 150 mm. needs careful watching and moderate eliminative treatment; and that a pressure of over 150 mm. needs usually active eliminative treatment, and will in all probability, especially if it shows a tendency to climb higher, require the induction of premature labor.

ANAPHYLAXIS AND ITS RELATION TO CLINICAL MEDICINE.

ANDERSON in the *Johns Hopkins Hospital Bulletin* for June, 1910, in writing on this subject reminds us that the earliest experimental work upon this subject was that by Richet, working with actinia poison in dogs. Richet coined the word "anaphylaxis" from two Greek words — *ανα* (against) and *φυλαξ* (guard), or *φυλαξις* (protection). He considered the condition an opposite one to that of prophylaxis; but we now know that the phenomenon, instead of being a disadvantage, is probably an important step in the protection of the organism against a certain large class of infections.

The condition of anaphylaxis may be transmitted from the mother or may be acquired, and it may be brought about by the introduction of any strange proteid into the body. A well-known clinical instance of anaphylaxis is that induced in an individual by a second vaccination. In the reaction to a primary vaccination the incubation period is about four days—*i.e.*, in about four days the local symptoms at the point of vaccination appear or become distinctive, and there is more or less constitutional disturbance. In a secondary vaccination, or a vaccination following a successful vaccination after some months, the period of incubation is much shortened and the clinical reaction very much lessened. In other words, the power to react has been so changed that, instead of an incubation period of four days, we have an incubation period of twenty-four to thirty-six hours. This acquired power of immediate response is an evidence that protective bodies have been formed within the organism; but there is no absolute immunity in this class of infections, though on account of the power of immediate reaction the individual is protected.

Other well-known clinical instances of anaphylaxis are the tuberculin and mallein reactions in tuberculosis and glanders. Neither of these bacterial products is harmful in moderate amounts to a healthy individual, but a person suffering from tuberculosis or glanders will respond to a very small amount of tuberculin or mallein respectively.

It has been known since the sixteenth century that the whole blood of certain animals is poisonous when transfused or injected into man. Many workers have found that the blood serum of an animal of one species is frequently poisonous when injected into an animal of another species, but that the serum of the horse, and the donkey to a large extent, lacks such poisonous properties. Large amounts of horse

serum may be injected into man, the rabbit, the guinea-pig, and other animals without causing any unpleasant results except possibly a slight reaction at the site of inoculation. In a certain proportion of cases, however, the injection of horse serum into man is followed by the syndrome described and named by von Pirquet as the "serum disease." In a very small percentage of cases the injection of horse serum into man has been followed by sudden death.

Horse serum, when injected into guinea-pigs, is a comparatively bland and innocuous substance, but these animals may be rendered so sensitive that a second injection of horse serum may produce death or at least very severe symptoms.

The first injection of the foreign protein has so changed the mechanism of the animal's organism as to render it very susceptible to the second injection. A certain time must elapse between the first and the second injection in order that this hypersusceptibility may be manifested. This time varies from five to twelve days, and is in close accord with the period of incubation of the "serum disease" which von Pirquet places at eight to thirteen days.

As the first experimental work with anaphylaxis was done with horse serum, it was thought that diphtheria antitoxin had some part in this toxic action of the serum; but as it was soon found that the phenomenon could be induced by any protein such as those which have just been named, it was seen that diphtheria antitoxin, *per se*, had absolutely no part in the production of the phenomenon.

The toxic action following the injection of the serum is due to a protein in the horse serum and is entirely independent of the antitoxic properties of the serum. It would be exceedingly unfortunate if the studies upon anaphylaxis should in any way prevent the use of diphtheria antitoxin or any other therapeutic serum when it is indicated.

The symptoms produced by the injection of horse serum into a susceptible guinea-pig are exceedingly characteristic. They are apparently the same whether the animal be given the injection subcutaneously, intravenously, intraperitoneally, or into the brain. When injected into the brain the symptoms appear very much more quickly, and frequently with explosive violence in some instances, the animals dying within three minutes after the injection.

At least a certain time must elapse between the first and the second injection of the protein before the anaphylaxis is manifest. This time or period of incubation is from seven to twelve days, which is about the same as for the serum disease in man, and is very similar to the period of incubation of a number of the infectious diseases. The optimum period or interval for the development of anaphylaxis is after three weeks.

Rosenau and Anderson believe that the portion of the protein which sensitizes the guinea-pig is the same as that which later poisons it, and Wells has brought forward experimental data to show that the two are at least in the same protein molecule or are two separate portions of the same molecule. The effect of heat in modifying or destroying the anaphylactic properties of proteins depends upon its effects in rendering the proteins insoluble rather than the production of chemical changes in the proteins.

Various procedures, such as the administration of atropine, injections of chloral hydrate plus urethane and adrenalin, pure oxygen, and production of ether, or alcohol, narcosis, all seem to exert favorable influence upon the outcome of anaphylaxis when given a short time previous to the intoxicating injection.

An interesting fact in connection with the specificity of the reaction is that guinea-pigs may be sensitized with three proteins at the same time, and that the animal differentiates the anaphylactic-producing substances in a separate and distinct manner and is found to be susceptible to a second injection of each one of the three substances in the same way that an animal is susceptible to three separate infectious diseases. Guinea-pigs may readily be sensitized by feeding them a protein for several days, and when tested for their susceptibil-

ity after fourteen days by an injection of the protein they are found to be sensitive.

The experiments upon the transmission of anaphylaxis by the female to her young are of very great interest in relation to the question of an inherited tendency to tuberculosis in children born of a tuberculous mother. It is generally accepted, Dr. Anderson believes, that the children of a tuberculous mother, instead of having an immunity to tuberculosis, on the other hand, are more susceptible. Only very rarely is the child born with the seeds of the disease in its system, but there is transmitted from the mother to her offspring a tendency to the disease.

Man may be sensitized in the same way as has been shown to be the case with guinea-pigs, and von Pirquet and Shick in their work upon the serum disease found that when the second injection was given, after an interval of fourteen days to four months, they obtained what they termed their "immediate" reaction, in which the symptoms of the serum disease appeared at once or within twenty-four hours; but that when the interval was more than four months they obtained little or no immediate reaction, but instead what they termed the "accelerated" reaction, in which the symptoms of the serum disease appeared on the fifth to the eighth day.

The unfortunate accidents, such as collapse and sudden death, following serum injections depend more upon individual sensitization than upon the so-called toxicity of the serum used. It has been found that serum which has not produced untoward symptoms when injected into man is fully as toxic for sensitive guinea-pigs as serum the use of which has been followed by serious symptoms or even sudden death when injected into man. It is a most interesting fact that many of the cases of sudden death following the first injection of serum in man have been in asthmatics or in persons who have an idiosyncrasy to horses—that is, there are certain individuals who show peculiar symptoms resembling hay-fever or asthma when in the vicinity of horses or horse stables, and these individuals are the ones so extremely susceptible to the first injection of serum. The knowledge of the fact that the injection of horse serum into such persons is a danger must certainly be taken into consideration in the use of antitoxin.

CREAM OF TARTAR IN THE TREATMENT OF CARBUNCLE.

The *New York Medical Journal* of May 28, 1910, states that potassium bitartrate has heretofore been used but little if at all as a topical application. Of late, however, some of the Italian physicians have looked upon it as a valuable antiseptic and absorbent. A writer in the *Semaine Médicale* of May 11, after remarking that in 1893 that journal mentioned its use by Oteri in chancres, chancroids, and the sores resulting from the bursting or incision of buboes, informs us that Dr. P. Lupò, of Naples, has recommended it as a dressing for carbuncles, and that another Italian physician, Dr. A. Miranda, has found it efficient in the treatment of that disease.

Miranda, says the writer, recently had occasion to employ cream of tartar in a very grave case of carbuncle in a diabetic subject, fifty years old. On the back of the neck immediately below the hairy scalp there was a large carbuncle, surrounded by a hyperemic and infiltrated zone, which rendered the least movement of the head impossible. There was intense headache, there were night sweats, the tongue was dry, the pulse was small and hard, and the temperature was above 102° F.

After careful disinfection of the affected region a crucial incision was made, each cut being about three inches long and extending down to the cervical aponeurosis. The flaps thus formed were lifted from the underlying parts and the cavity was plugged with boiled gauze impregnated with cream of tartar. Under the influence of this dressing the temperature fell almost to the normal point, the tongue became moist, and the patient's general condition was considerably ameliorated. When the dressing was removed, it was found that

the lymphangitis had almost entirely disappeared and that the inflammatory edema surrounding the swelling was notably diminished. On the gauze there were noticed numerous bits of necrotic tissue. The cavity was thoroughly irrigated with sterilized water and dressed again as before. This was continued until the fourth day, when a solution of corrosive sublimate or of iodine was substituted for the sterilized water. At the end of twelve days the wound was covered with vigorous granulations.

On the strength of this case, Dr. Miranda thinks that the cream of tartar dressing is far preferable to the use of the actual cautery and to the application of such chemical caustics as zinc chloride, iron perchloride, etc., which are very painful and give rise to such great losses of substance as often to call for plastic operations, and lead to scars which are not only unsightly but also crippling. Care must be taken, he says, that the bitartrate is brought into intimate contact with the inflamed parts, and he thinks that the powder is preferable to a solution.

THE OBLITERATION OF THE CRAVING FOR NARCOTICS.

In the *Journal of the American Medical Association* of May 14, 1910, PETTEY writes on this subject, and with the hope of making the principles of treatment which he suggests of practical value, he gives in detail an outline of treatment suitable to an uncomplicated case of morphinism in which the patient is taking not more than 10 grains of morphine a day.

Thorough elimination of toxic matter from the system is the primary and most essential step in the treatment. The principal obstacle to securing action of purgatives in drug habitués arises from the suspension of peristalsis by the primary effects of the opiate. During a period varying from four to eight hours from the time of taking a dose of morphine intestinal motion is almost if not entirely absent, but as the early effects of the dose subside peristalsis is again gradually reëstablished. Drug users as a rule take their drug only during the day, or from the time of rising in the morning till bedtime, say from 8 A.M. to 10 P.M. During these hours the system is kept constantly under the primary effects of the opiate and intestinal motion is very much restricted, but between 10 P.M. and 8 A.M. the effects of the day's dosing wear away and peristalsis becomes fairly active, and it is during the latter part of this period that the excretory organs do the principal part of their work.

In order to secure sufficient action of purgatives, advantage must be taken of this state of affairs and the remedies so compounded and given at such time as to have the acme of their effects, both as motor and secretory stimulants, occur during the latter part of this period, when the system is least under the restraining influence of the opiate. To do this, begin at 2 P.M., and give, on an empty stomach, a capsule containing the following:

> Calomel,
> Powdered extract cascara, ää 0.13 (gr. ij);
> Powdered ipecac, 0.016 (gr. ¼);
> Phenolphthalein, 0.06 (gr. j);
> Atropine sulphate, 0.0002 (gr. 1/200);
> Strychnine nitrate, 0.002 (gr. 1/30).

Repeat a capsule of this size and strength at intervals of two hours up to 10 P.M., making five such doses. The patient is given his drug in the usual sized doses up to 8 or 10 P.M., but none is to be given from that time until after the bowels have been thoroughly emptied on the following morning. Nothing in the way of nourishment should be allowed to go into his stomach during a period beginning as much as six hours before the time of giving the first purgative capsule and ending after the purgation is completed. Then the patient may be given nourishment.

With a patient of average size and weight taking not over 10 grains of morphine a day, the strychnine and atropine in these capsules will excite a fair degree of peristalsis notwithstanding the restraining effects of the opiate, and this will enable the glandular stimulants given with them to

induce free evacuation from the bowel in from eight to ten hours from the time the last purgative capsule was given, thus securing bowel movements before the time for the usual morning dose of morphine; but, more certainly to secure this result, six hours from the time the last purgative capsule was given 1/20 grain of strychnine should be given hypodermically, and followed half an hour later with 2 ounces of castor oil or a bottle of citrate of magnesia. Both the strychnine and the oil, or saline, should be repeated at intervals of two hours until the intestinal canal has been thoroughly emptied. No morphine or other narcotic is to be given during this time. If the bowels begin to act before the time for taking the usual morning dose of morphine the patient will experience no discomfort, but, on the contrary, the relief afforded by the active elimination will be such as to enable the individual to go several hours beyond the time for the morning dose without feeling the need of it, and this should be done, thus allowing as much time for elimination as possible. When the patient has gone as long as he can without discomfort and begins to feel the need of the drug, it should be given, but in reduced doses. It will be found that after the bowel has been thoroughly emptied and the patient has gone without the drug several hours beyond the usual time for taking it, not more than half the morphine he had been taking will be required to meet the demands of the system. This reduced quantity should be given at the same intervals at which the individual had been taking doses of morphine, and a liberal diet should be allowed.

Forty-eight hours from the time the first purgative course was begun, another, in 5 capsules of the same size and strength, should be given, preceded by six hours' fasting.

The patient should be given the morphine in as small doses as will keep him comfortable up to the time of his evening or bedtime dose on this day, and this should be the last opiate given in the case. Six hours from the time of giving the last capsule of the second purgative course, the strychnine and oil, or saline, should be given as before and repeated if necessary until free bowel movements have been obtained. During this time the patient should be given a bath and put to bed.

The action of this course of purgation will carry out of the system a residue of extremely toxic matter, and the patient will experience such relief from it as to enable him to go even longer beyond the time for his accustomed dose than he did after the first course, especially if he remain in bed, which he should do. In the course of from six to eight hours after the time for his morning dose, however, he will begin to feel uncomfortable and require something for relief; then, instead of giving the opiate as before, scopolamine 1/200 grain should be given hypodermically and the same dose repeated in thirty minutes.

The patient will usually fall asleep within half an hour from the time of giving the second dose of scopolamine, but if not, and if he is at all uncomfortable, a third dose of the same size may be given. If the patient is not uncomfortable, let him go until the lapse of an hour from the time of giving the second dose. If at the end of that time he has not fallen asleep a third dose should be given. This dose may be of the same size of the other two, or it may be increased to double that size, depending on the degree of impression made by the preceding doses. If the patient has no unusual tolerance for the drug, these doses will bring him under the influence of the remedy to such a degree as either to induce sleep or to establish a slight belladonna intoxication, in either of which conditions he is free from suffering. If he goes to sleep he should be allowed to sleep until he wakes, even if that be six or eight hours, but when he does wake, no matter how comfortable he may feel, an additional dose of scopolamine should be given; usually 1/200 grain is sufficient, but that must be regulated by the susceptibility of the patient. These doses must be repeated at such intervals as may be required to keep up a mild belladonna intoxication and keep the patient free from pain. He may sleep

more or he may not, but that does not matter so long as he is kept in a comfortable condition. He should be impressed to this degree with scopolamine for a period of thirty-six hours from the time of beginning this remedy, and then all narcotic medication should be discontinued.

During the time the patient is kept under the influence of scopolamine it is usually well to give 20 grains of sodium hyposulphite every two hours, and these doses should be discontinued for twenty-four hours or more after the scopolamine period has passed. These small, frequently repeated doses of hyposulphite supplement the effects of the calomel purge, and after they have been kept up for from twenty-four to thirty-six hours the patient will begin to have small, bilious stools, unattended by colic, griping, or other distress, and these will more fully cleanse the system from toxic matter and prepare the patient for a rapid and successful convalescence. This period is reached by the end of the fourth or fifth day from the beginning of treatment, after which no medication is indicated, so far as the addiction itself is concerned. The patient will have no desire for his drug, nor will he suffer because of abstinence from it. It is true he will feel weak and miss the support of the artificial stimulant to which he has been accustomed, but the unbearable nervousness, hot flashes, aching of the limbs, labored heart action, sweating, diarrhea, restlessness, and insomnia so marked under most other plans of treatment will be absent and the patient will be able to lie quietly on the bed, pass his time in comfort, and not only will he enjoy taking nourishment, but he will digest and assimilate it in liberal quantities. So marked is this feature that it is not at all unusual for patients thus treated to gain a pound a day until they have fully regained their normal weight.

If the heart action is at all deficient either during or after treatment, sparteine sulphate in doses of 2 grains at intervals of from four to six hours will give it reliable and uniform support, and this without detriment to the patient; but it is rarely necessary to use anything for this purpose. The relief afforded the heart by cleansing the system from toxic matter and unloading the portal system is more than enough to compensate for any support it had been receiving from the opiate, and the circulation is better than it was under the opiate.

THE TREATMENT OF SCARLET FEVER.

LEAHY in *Long Island Medical Journal* for June, 1910, gives the methods adopted in the Willard Parker Hospital for Contagious Diseases in New York.

Upon admission all cases receive a dose of antitoxin, 1000 units as an immunizing dose. The reason for this is seen when it is remembered that most cases of scarlet fever have some membrane in the pharynx or in the tonsils. It is impossible to distinguish this membrane without a culture in most cases from that occurring in diphtheria, and it is not an uncommon occurrence to see the two diseases together in the one person. As in diphtheria all throats are cultured, and the nose also if there be a discharge. If the throat be very much inflamed, or membrane present, the throat is irrigated every two hours, as in the treatment of diphtheria, with normal saline at the same temperatures. As the inflammation subsides and the membrane disappears the irrigations are continued every four hours. The nose also is irrigated if there be much discharge from it.

All patients are placed on a strictly milk diet upon admission until the temperature and acute symptoms have subsided or until the urine has cleared up, if albumin has been present. The urine is examined daily for the first week and every other day for the second week. Thereafter it is examined twice a week until the patient is discharged.

The patients receive a warm bath every morning, and although plenty of fresh air is advisable, care is taken to protect them from draughts. When desquamation begins care is taken to prevent the spreading of the desquamated skin. The desquamated skin, however, is not regarded as being the only source of contagion in this disease.

The mouth and nasal discharges are regarded as being highly contagious in the early stages of the disease, and special care is taken of these discharges. As soon as desquamation is well established and following a warm bath every morning, the hands and feet, from which the desquamated skin comes off slowly and disappears last, are rubbed thoroughly with a cake of pumice stone, in order to remove the adherent desquamating skin.

For the disease itself very little medication is used. When the heart's action becomes weak or the patient becomes prostrated, stimulating and supporting treatment is indicated. Very often cases are encountered which are septic in character and which are rapidly fatal in spite of treatment. Nothing in the way of specific medication is attempted in the treatment of this disease.

The most frequent complication of scarlet fever is acute parenchymatous nephritis. In the early stage of this complication fluids are limited; later, when the inflammation begins to subside, an abundance of fluids is permitted. Where there is much edema, free catharsis is instituted with high, hot rectal irrigations of normal saline given every four hours. In connection with this, hot packs or hot-air baths to promote free perspiration are given. When uremic convulsions supervene, normal saline in the form of hypodermoclysis or in the form of intravenous injections is given. All these measures tend to relieve the kidneys and at the same time dilute and get rid of the toxic material present in the body.

Another frequent complication is otitis media. The ears are examined two or three times a week and watched carefully. If the patient runs a temperature after the original fever has subsided it is generally due to an inflammation of the middle ear. As soon as the redness of the drum becomes well marked, paracentesis is practiced. The ears are then irrigated every four hours with hot normal saline solution. The patients are kept in bed a week after the temperature has become normal, and are then allowed to get up provided there is no nephritis or other complication. The cases are isolated thirty-five days, and at the end of this time are viewed by an inspector, who determines whether or not desquamation is complete, and if not the patient must remain in the hospital until it is complete.

EPILEPSY.

The *British Medical Journal* of April 9, 1910, contains an article by TURNER in which he states that he wishes to emphasize the importance of separately considering the treatment of recent epilepsy from that of the confirmed disease.

There is no single specific remedy in the treatment of epilepsy, although the alkaline salts of bromine come nearest to this definition. But the influence of the bromides upon epileptic convulsions is variable and uncertain.

Bromide medication may arrest the seizures immediately, or within a short period of their administration, temporarily or permanently. In this division most of the curable types of epilepsy are found—cases characterized by an absence of mental impairment and with fits recurring only at long intervals. If any given case is capable of arrest, a satisfactory response will be apparent within a comparatively short period of commencement of the bromide treatment. In 86 cases, in which the fits were arrested for periods varying from two and a half to twenty-two years, rather more than 50 per cent yielded to treatment within the first twelve months of regular bromide administration. (Out of 366 cases of epilepsy, 86, or 23.5 per cent, belonged to this class.)

The bromides may induce a lessening in the severity and frequency of the seizures. This is the common temporary result of bromide treatment, and is what may be confidently expected in the majority of cases in the early stages of the disease. Sometimes the change is effected by the arrest of the major seizures, the minor continuing; or the bromides may change the time-incidence of fits from the waking to the sleeping hours, or *vice versa*. (In the series

of 366 cases of epilepsy in which bromide medication was continued over long periods, 105, or 28.7 per cent, belonged to this class.)

The bromides may exert no influence at all upon the disease, or may even augment the frequency or severity of the seizures. (In the series already quoted, 175, or 47.8 per cent, remained unimproved, and became confirmed epileptics.) These numerical facts may be given in the form of a table showing the general results of treatment by the bromide salts in 366 cases of epilepsy:

Cases of arrest.....	86 or 23.5 per cent.
Cases showing improvement.	105 or 28.7 per cent.
Confirmed cases.....	175 or 47.8 per cent.
	366 or 100 per cent.

These statistics are in general harmony with the observations of other writers on the subject; they demonstrate clearly how large a percentage of epileptics derive no benefit from bromide treatment. This is within the knowledge and personal experience of most physicians who have had to treat even small numbers of epileptic patients. A further conclusion drawn from the study of these figures is that, under the influence of the salts of bromine, a considerable number of cases of epilepsy are temporarily "cured," or materially improved. It is, however, within the experience of most observers that no complete record can be obtained of the total number of cases which are relieved by these means, as, more especially amongst hospital patients, there is a tendency, once the fits have been temporarily arrested, for the patient to cease attendance. Notwithstanding the unfavorable results of treatment in many cases, it would be an error to say that bromides are useless in the treatment of epilepsy. If 50 per cent of the cases derive benefit from the administration of these drugs, then all cases, especially of recent onset, should be given the benefit of the drug for a time. It is not the bromide salts as a remedy, but the method of administration, which is harmful, and to this attention will be directed immediately.

The physiological action of the bromide salts consists in lessening the irritability of the central nervous system, and in exerting a subduing effect upon reflex activity and cerebral function. The potash salts of bromide also induce a slowing of the pulse and the action of the heart. In medium doses (30 to 60 grains) the bromides produce muscular fatigue, a slowing of the mental processes, dulling of the sexual function and of the skin sensibility. In large doses (150 to 225 grains) the speech becomes slurred, there is abolition of the palatal and pharyngeal reflexes, while frontal headache and a limitation of the power of thought soon ensue. Salivation, lowering of the body temperature and of the pulse-rate, catarrh of the stomach and of the respiratory mucous membranes, are general bodily symptoms resulting from continual use of large doses of the bromides. It is therefore obvious that the prolonged and injudicious use of the bromides may give rise to toxic symptoms known as "bromism." This condition is characterized by a blunting of the intellectual faculties, impairment of the memory, and the production of a dull and apathetic state. The speech is slow, the tongue trembles, the saliva may flow from the mouth, the gait is staggering, and the movements of the limbs feeble and infirm. The mucous membranes suffer so that the palatal sensibility may be abolished, and nausea, flatulence, and diarrhea supervene. The action of the heart is slow and feeble, the respiration shallow and imperfect, and the extremities blue and cold. An eruption of acne frequently covers the skin of the face and neck.

Bromide treatment should be commenced at the earliest possible time after the onset of the fits, as there is a greater prospect of arrest or improvement during the first five than during the second five years of the disease, although arrest of the seizures may occur after a duration of twenty years. The administration of the bromides should be continued for a period the duration of which is to be determined by the study of each case separately, but should not be less

than two years. The dose usually given is, the author thinks, too large. If benefit does not follow a daily dose of from 45 to 90 grains of one or a combination of the bromide salts, some other remedy or method of treatment should be sought for and applied. Dr. Clouston long ago pointed out that no lessening in the number of fits occurred when the daily dose of bromide exceeded 75 grains.

The large doses sometimes prescribed—from 100 to 150 grains daily—although no doubt suppressing the seizures for a time, induce other and more serious phenomena, namely, those of bromism, already described. Moreover, the bromides have an accumulative action. Laudenheimer has shown that an epileptic taking 10 grammes (150 grains) of bromide salt daily for eight days only excreted a total of 35 grammes, or less than half the quantity ingested during that period. He also showed that no results followed its administration until an equilibrium was established between the intake and the output. This occurs on saturation of the body, and requires about 30 grains of bromide to be given daily for three or four weeks. It is also largely dependent upon the amount of sodium chloride taken in food.

Most physicians have their own methods of prescribing the bromides in epilepsy. As already mentioned, large doses are not necessary nor are they effectual, but both the amount of the dose and the frequency and time of administration should be gauged by a study of individual cases. In the discussion of the dietetic treatment of epilepsy reference is made to the deletion of salt, in the form of sodium chloride, from the dietary. This is an important modification in the treatment of epilepsy, as much smaller doses of the bromide may be prescribed. The potassium, sodium, strontium, and ammonium salts are the most usually administered. Each is of value, but the sodium salt is the most efficacious. If the bromides are prescribed in combination the dose should not exceed 60 grains in the twenty-four hours. The bromide of strontium is less useful, but may be given in smaller doses, or in combination with one of the other salts.

Combinations of the bromide salts with other remedies which may have some influence either upon the nervous or circulatory systems have been from time to time recommended, and are found useful in some cases. A combination of the bromides and digitalis has been found very satisfactory in cases of low arterial tension, irregular action of the heart, or failing compensation with valvular disease. Chloral hydrate may be added with great advantage in cases of prolonged serial epilepsy, or of the status epilepticus. The bromides and the glycerophosphates form a valuable combination in weak or debilitated cases, more especially in young women with anemia or neurasthenic symptoms. Bechterew recommends the conjunction of the bromides with adonis vernalis, and sometimes with codeine. A combination of a bromide salt with borax has been of service where the bromides or borax, separately, have been of little use.

Of the combinations of the bromides with other remedies the author has found Gélineau's formula the most useful and satisfactory. It is prescribed in the form of dragées containing 1 gramme of the potassium bromide, 1/3 mg. of picrotoxin, and 1/2 mg. of antimony arsenate. It has been used extensively in France, but does not seem to have been adopted to any extent in Britain. The author has been in the habit of prescribing it during the past two years in those cases of epilepsy in which the pure salts of bromine are either not well borne or have been proved to be ineffective. In large doses picrotoxin is a producer of convulsions, leading to spasms of a tetanic character, with death in coma. In small doses it is theoretically supposed to lessen the tendency to cerebral vasoconstriction, which is believed by some writers to be a fundamental factor in the causation of epileptic fits. The author has used these dragées in all forms of epilepsy with considerable success. His experience is that they are:

1. A more successful remedy in most cases than a single bromide salt.

2. Less likely to lead to troublesome symptoms—that is, acne or bromism.

3. More easy of administration, being especially convenient when it is desired either to augment or diminish the dose.

The method of prescribing them is simple—one dragée is taken either during or immediately after a meal, thrice daily for a week, an additional dragée being added weekly until the patient is taking four, five, or six per diem. The author has found six dragées a day usually sufficient to hold the fits in check, although, according to Gélineau, as many as ten or twelve daily may be taken. His experience of the remedy has not been sufficiently long to say definitely whether it is better in all cases than bromide alone, but with two or three exceptions it has been of great service in diminishing or even arresting fits in cases in which the bromides alone have been of no use.

In the days before the introduction of the salts of bromine in the treatment of epilepsy, many remedies were used, sometimes with marked success, as may be seen from the satisfactory results obtained by Herpin, Reynolds, and others. On account of the not infrequent failure of the bromides to arrest or even to ameliorate epileptic attacks, it will be found necessary to prescribe some other medicinal remedy, and a large number have been from time to time advocated and employed. Perhaps the drug most frequently used as a substitute for, or as an adjuvant to, the bromides, more particularly in England, is borax (sodium biborate). Introduced by Gowers many years ago, it has met with considerable favor in cases in which the bromides have been of little service. Unless in combination with a salt of bromine, the author has not found it of particular use. It may be given in doses of from 10 to 30 grains thrice daily, but is apt to induce troublesome gastrointestinal symptoms. If continued over long periods it may lead to cutaneous eruptions of a psoriasis-like character.

Belladonna was the chief anti-epileptic remedy of the prebromide days, and is still used in some cases with marked benefit when the bromides or other remedies have proved unsuccessful. It formed the chief remedy of Trousseau, Hufeland, Herpin, Reynolds, and others, and in the hands of the first named was mainly used in those cases complicated with nocturnal incontinence of urine. A combination of bromide and belladonna may be found useful in cases of otherwise intractable combined seizure types. It may be prescribed either in the liquid form, as the tincture, in doses of 5 or 10 minims, or in the form of a pill made of the extract of pulvis belladonnæ. The zinc salts (oxide, valerianate, and lactate) are old-established, and were occasionally successful remedies in the hands of the French physicians. Opium, as a remedy for epilepsy, dates from classical times. It is now used only in the opium-bromide method recommended by Flechsig. The experience of the author with this treatment has not been such as to encourage further trial. Strychnine has been recommended from time to time, and used with considerable success by some physicians. In doses of gr. 1/16 daily it may be continued over considerable periods. Its modus operandi is probably merely as a nerve tonic, although it may have some influence in strengthening the tone of the vasomotor centers. Strychnine finds its most useful application in the treatment of nocturnal epilepsy, especially when there is reason to suppose that the blood-pressure is materially lowered. Monobromate of camphor, eosinate of sodium, chloretone, and numerous other remedies have been tried, but without any special benefit. The author has seen no particular advantage obtained by the use of bromipin, bromalin, and bromocarpine.

Recent examinations into the coagulation of the blood in epileptics have led to the suggestion that the salts of calcium may be of use in arresting or diminishing the frequency of epileptic seizures. As already shown, however, considerable discrepancy exists as to whether the blood in epilepsy

coagulates more readily during a fit period. A more rapid coagulability during the four-and-twenty hours preceding a major seizure or serial attacks has been demonstrated by Dr. John Turner; on the other hand, the observations of C. Besta showed a diminished rate of coagulation, the fits apparently exerting no influence upon this. Donath prescribed chloride of calcium to a limited number of epileptics without materially affecting the number of the fits. The author has himself prescribed the lactate of calcium in 10-grain doses in combination with bromide of potassium in a few cases with very satisfactory results, and Dr. Littlejohn reports a case in which calcium lactate alone was prescribed with much benefit. It would therefore appear that the salts of calcium, which physiologically increase the coagulation of the blood, are worthy of further study in the treatment of epilepsy. It is not unlikely that the special type of the disease most suitable for treatment by these salts has yet to be defined, as it is obvious that all fits are not associated with increased blood coagulation.

The question as to how long bromide or any other form of medicinal treatment should be maintained is not one upon which any rigid statement can be made. Some authorities maintain that treatment should be continuous for a period of at least two years after the last seizure, but their experience at the Queen Square Hospital points to a much longer period as necessary. Epileptics attend there for many years after the arrest of the fits, as they find that stopping the bromide, even for a short time, conduces to a return of giddiness or of "sensations" reminding them of their previous attacks. If nine years' freedom from fits is to be a gauge of a "cure" of epilepsy, then withdrawing the bromide under a period of five years in those in whom the fits are arrested would be injudicious. On the other hand, many persons in whom the disease has been arrested after a year or two of bromide treatment remain free from attacks without the aid of any medicinal remedy. The important practical point in this connection is that those patients who take bromide well and in whom the fits are thereby kept in subjection ought to persevere with the remedy, and not to stop it. It is just when the fits have been satisfactorily controlled that further treatment is of most use. The withdrawal of medicinal treatment in those in whom the fits have been arrested should be carried out gradually. Under no circumstances should bromides be withdrawn suddenly after their prolonged use.

It may be useful to refer to some of the miscellaneous plans of treatment in this place, as a case which has resisted one form of treatment may react for a time satisfactorily to another. It should, on the other hand, not be forgotten, what is a well-recognized axiom in the management of epilepsy, that cases of this disease may respond favorably for a time to each and every change of treatment, medicinal or other, and even when active treatment is stopped. As the disease is characterized by spontaneous remissions in the frequency and severity of the seizures, a favorable result may occur, not on account of, but in spite of, therapeutic or other measures.

Of all the recent systems, that which seemed likely to be of most use was the introduction of the organic extracts in the treatment of this disease; but further experience with these preparations has been, on the whole, disappointing.

The administration of extract of the thyroid gland, or of idothyrin, was at one time strongly advocated, more with a view to counteract the coexistent mental deterioration than as a subduer of convulsions. In a number of cases of confirmed epilepsy, in which preparations of the thyroid gland were given over considerable periods, no appreciable diminution was detected in the frequency of the seizures, and in only a limited number of cases, and for brief periods, was there any lessening of the coexistent dementia. In the author's experience thyroid medication tends rather to increase the number of fits, and to produce at times irritability and want of control. Preparations of the thymus gland act injuriously in epileptics by increasing the

number of the seizures. Cerebrin has not been found to be of any value.

The treatment of epilepsy by the injection of blood serum, either from another epileptic or by reinjection of the blood serum into the same epileptic, was introduced by Ceni, who believed that a soluble epileptogenous poison existed in the blood serum in quantities varying with the severity of the disease. Ceni's view differed from that held by most supporters of the autotoxic theory of convulsions in that the amount of poison circulating in the blood did not change in the different stages of the disease. As the result of a number of observations, Ceni concluded that there exists in the blood of epileptics a soluble latent biochemical substance, an autocytotoxin, which has an influence over the elaboration of epileptogenic toxic agents, and produces its results after repeated injections. The records of these observations show that in some cases a beneficial, and in others an unfavorable, result followed the injection of the blood serum of epileptics into other epileptics. The practical utility of this method in the treatment of epileptic fits has not, even in the hands of its originator, proved sufficiently satisfactory to render its application general; while later investigations, more particularly those of Sala and Rossi, Ferharz, and others, failed to confirm Ceni's results or to establish any benefit at all from the injection of the blood serum of epileptics into others subject to epilepsy.

Consideration should also be given to the question whether it is possible to arrest an attack once the warning has commenced. Many methods have been suggested for this purpose, some of which are of old standing and date from the time of Galen. The attacks in which abortive measures are likely to be successful are those commencing with a peripheral aura. The common method of encircling the wrist, for example, with a ligature or tape, and making traction upon it as soon as the aura is felt in the hand, is well known. As great force is sometimes required to arrest the attack, a strap is preferable to a tape or ligature. Sometimes the patient alone is unable to produce sufficient compression, and requires the assistance of a second person. A circular blister was suggested by Buzzard, in order to induce a more permanent effect —sometimes with advantage.

Forced extension or movement in the direction opposite to the warning sensation may be efficacious when compression alone is unsatisfactory. According to Herpin, the most effectual means of arresting such attacks is a combination of circular compression and forced movement in the opposite direction. Friction, or rubbing the extremity of the limb where the sensation starts, has also been of use; and the writer has known a patient to bite the finger in which the aura commenced, sometimes with a successful issue.

Abortive means are less satisfactory in cases with a visceral aura. Strong pressure by the hands over the epigastrium is resorted to by some epileptics, while others prefer to drink cold water; swallowing a few drops of ether has also occasionally resulted in arresting an attack. Inhalations of ammonia have been used successfully. Other patients refer to a method of autosuggestion, bringing to bear a strong determination to overcome the attack—a method which undoubtedly has been followed by success in some cases.

The inhalation of nitrite of amyl is a method of arrest more especially valuable in fits with cephalic warning, and particularly in those with olfactory sensations (Gowers). Pierce Clark has insisted upon this remedy as a satisfactory means of aborting fits.

It has been shown that a gradually increasing number of seizures is the usual sign of the onset of the status epilepticus, or of prolonged serial outbursts. With this warning the dose of bromide should be increased even up to double the quantity, and chloral (10 to 15 grains) should be added, and the mixture repeated every four hours. Clark recommends the addition of a solution of morphine to the draught.

Should the fits be recurring with great frequency and severity, no remedy is of

greater benefit than the inhalation of chloroform given up to complete anesthesia. On the other hand, in less severe types of status, or in serial epilepsy, a combination of a bromide salt (gr. xx) and chloral hydrate (gr. x) may be repeated frequently (about every two or three hours) for a time with benefit, especially in the latter condition.

The bromides given alone are of little avail, but within recent years their hypodermic administration in sterile solutions of not more than 10 per cent (Clark) has been recommended. These may be repeated until 60 or 100 grains have been injected.

Injections of the bromides by means of lumbar puncture have also been advised, in sterile solutions of 30 grains to the ounce, 10 or 15 Cc. of the cerebrospinal fluid being withdrawn before 10 Cc. of the bromide solution is injected. The hydrobromate of hyoscine has also been used occasionally with success (gr. 1/75 to 1/100 hypodermically).

In the postconvulsive, stuporous stage of status epilepticus the treatment is that of acute dementia—strychnine, digitalis, and alcohol, if there is much cardiac debility. Abundance of nutritious food and careful nursing are essential features in the general management of this period.

As already described, acute mania, whether occurring as a postparoxysmal phenomenon or as a psychical equivalent, is characterized by the suddenness of its onset, the intensity and violence of its manifestations, and the shortness of its duration, extending usually over a few hours. All that is therefore required lies in protecting the patient, and those attending him, from the effects of the violence and excitement. For this purpose resort may be had to several attendants, or if a drug be considered advisable, in the author's opinion there is none more safe to administer, or more speedy, certain, and satisfactory in its action, than the hydrobromate of hyoscine in doses of 1/75 to 1/50 grain, injected hypodermically. One injection is usually sufficient to induce quiet and repose for a period of several hours.

In cases of confirmed epilepsy with mental deterioration the use of the bromides is of relatively little value. According to Féré, the bromides are only of use when the dose is so large as to produce toxic effects. Their continued administration in these cases does, however, produce a diminution in the number and perhaps in the severity of the seizures. With a view to test the efficiency or otherwise of a 30-grain dose of bromide salt administered every evening to a number of confirmed epileptics in an institution, the dose was stopped for one month, and the total number of fits with or without bromide was compared. During this period the fits were increased in frequency by about one-third (278 to 402).

It was long ago pointed out by Esquirol that any change of treatment was temporarily beneficial. Bringing epileptics under the generally favorable hygienic surroundings of a hospital will often conduce to material temporary improvement without the aid of any medicinal remedies. As with medicinal treatment, so with dietetic modifications: the author asserts he has not observed any material benefit obtained in cases of confirmed epilepsy by aid of the salt-free or purin-free diets. The majority of the cases feel better when on the purin-free diet, but there is no marked improvement in the frequency or severity of the seizures, except perhaps in those cases in which the fits occur in series. These observations would bear out what has been constantly noted in the treatment of epilepsy, namely, that in the confirmed disease with mental impairment little, if any, benefit is derived from treatment, either medicinal or dietetic. In other words, those cases in which the disease has become established upon an organic foundation require to be lodged preferably in an institution for epileptics, where they may be prescribed (1) regular and congenial employment, (2) a judicious alternation of work and play, and (3) a suitably arranged and simple mode of life, with avoidance of excitement and abstinence from alcoholic liquors.

ON THE FAILURE OF NERVE ANASTOMOSIS IN INFANTILE PALSY.

WARRINGTON and MURRAY (*Lancet*, April 2, 1910) have observed for the last three years five patients, four of whom suffered from infantile palsy. In two the upper limb was affected, in two the lower. The fifth was a traumatic lesion of the great sciatic nerve due to a dislocation of the hip. In none of these cases has any improvement, the direct result of the anastomosis, resulted. Improvement due to the natural processes of repair in the cord was observed in a considerable degree, quite sufficient to satisfy the parents of the benefit of the operation, but in no wise to be connected with the actual surgical interference undertaken. It may be confidently asserted that very few instances of a truly satisfactory nerve anastomosis for infantile palsy have been published. The cause of failure may be either that an inappropriate time is chosen for the operation, the surgical technique is at fault, or physiological reasons did not permit of recovery. Jones, particularly, has called attention to the power of recovery of muscles under proper treatment, rest, massage, and postural fixation, and together with Murray has reported several cases with great improvement in infantile palsy as long as two years after the onset of the disease.

No operation should be contemplated unless for six months from the onset of the disease assiduous treatment has been directed to the palsied muscles to improve their nutrition and to assist the return of power by adequate postural support; and further, at the end of this time faradic irritability must be absent, although a strong current is used whilst the patient is anesthetized.

Experience shows that it is the deltoid which, in all acute peripheral palsies of the upper arm, shows the least response to the methods of nature or art, and some means of restoring the power of abduction of the arm is urgently required—possibly the circumflex nerve may be anastomosed to another nerve. When a patient has not been under the most favorable circumstances adequate treatment should be adopted at least for three months before surgical interference is attempted. At the end of these periods of time in cases of infantile palsy some degree of certainty as to the impossibility of future natural recovery may be obtained.

In passing, it may be remarked that in obstetrical palsy and in spontaneous neuritis the natural tendency to complete recovery is greater than in infantile palsy, and amongst recorded cases of surgical treatment in the former group of cases are to be found instances in which the operation was superfluous.

In every case the paralyzed nerve was completely divided. In three cases the peripheral end of the nerve was engrafted into a longitudinal slit made in the sound nerve. In two cases an end-to-end anastomosis was made. In one of these the divided external popliteal was joined to a flap raised from the internal popliteal nerve; in the other case the spinal accessory nerve was completely severed and joined to the divided fifth cord of the brachial plexus. The suture material used was very fine silk. Care was taken in handling the nerves and in passing the sutures to bruise the tissues as little as possible. In no case was there any trouble whatever as regards the healing of the wound.

THE EXCLUSION OF THE SKIN IN SURGERY.

VALLACK (*Australasian Medical Gazette*, Feb. 21, 1910) observes that, next to garden soil, the most dangerous thing likely to get into a wound is the finger of a surgeon who is in the habit of allowing pus or other infective matter to get on his hands.

Infection derived from the hands of the surgeon and his assistants may be obviated by the use of rubber gloves. One has no hesitation in dogmatically asserting that the assistants should wear gloves always, and the surgeon almost always. One uses the qualifying adverb because there are a few cases in which the wearing of gloves is better avoided. The difficulty, for instance,

of suprapubic enucleation of the prostate gland would be vastly increased by wearing gloves. In curetting for miscarriage also the use of gloves interferes with the delicacy of touch necessary for detecting and removing small tags of decidua.

In abdominal sections with complicated adhesions the writer thinks that the greater delicacy and speed with which the bare hand can work more than compensate for the mild sepsis which it invariably introduces, for there can be no doubt that with gloves on one has a tendency to pinch the slippery viscera to prevent them from escaping from the fingers. He makes the reservation, however, that if one has touched septic matter, one should not operate with bare hands for at least a week afterward. He makes the further reservations that cases bad enough to justify us in discarding gloves are the exception, and that in any case the gloves should be resumed before inserting buried sutures in the abdominal wall.

With regard to the patient's skin, we have no such simple remedy, and the exclusion of bacteria from this source affords no easy problem. Hardening the skin with alcohol as suggested by Ahlfeld will prevent detachment of epithelium as long as the skin is kept dry, but as soon as it is moistened with sweat or blood the germ-containing epithelium becomes easily rubbed off again. The writer thinks that the plan which he suggested some years ago of stitching towels to the cut edges as soon as the incision is made is one of the best methods. As this appears to cost more patience than the average surgeon has to spare (the surgeon being of all men the least patient), the towels may be fastened by pointed clips or volsella to the skin instead of by sewing. Unless the towels are actually fastened to the skin they are liable to be pulled out of place and any amount of skin exposed. This proceeding effectually prevents buried sutures from trailing over the skin, and also prevents instruments or hands from touching it.

Döderlein has suggested an ingenious method for excluding the skin by means of a rubber paint, which he terms gaudanin. The skin is first "tanned" by painting with a solution of iodine in order to make the paint adhere, and then liberally painted with gaudanin. Döderlein states that when using this method he was unable to obtain cultures from his wounds, though he never failed to obtain cultures when gaudanin was not used, even though his own hands were covered by gloves. The writer has been using gaudanin for several years and finds it satisfactory, but it is liable to become detached from the skin during an operation, and of course it does not exclude germs at the actual cut edge of the skin. He is, therefore, in the habit of using towels clipped to the skin as an additional safeguard. After the skin has been prepared in the usual manner, and just before operation, the site for the incision and the skin for some distance round it are painted with liq. iodi fort. When this has dried it is painted with gaudanin, and this also allowed to dry, which it does quickly.

At the operation, as soon as the skin has been incised down to the deep fascia, a towel is placed on each side of it with its edge running alongside the wound. At each end of the wound the towels are made to slightly overlap, and then a pair of sharp-pointed clips are made to grasp both the towels and also the underlying skin, the points, of course, penetrating both towels and skin. The edges of the towel are now tucked over the cut edges of the skin on each side as far as the deep fascia, and fastened there with another pair of clips. Thus four pairs of clips are used, one at each end and one on each side. In a large wound more can be used if necessary. The clips are not removed (except for the purpose of lengthening the wound) until the operation is completed and only the skin sutures remain to be inserted.

He thinks that this method of excluding the skin is as perfect as our resources at present permit. The gaudanin is imported, and the best clips are the kind marked No. 4996 in the Holborn Instrument Co.'s catalogue; they have not been dignified by a special name. Ordinary uterine volsella

can be used, though they are rather clumsy. With regard to buried sutures, the writer never uses anything but chromic gut sterilized by heating for six hours in creosote at 100° C., after heating for two hours at 80°C. in the same medium to dry it. These matters consume a little time and trouble, but the surgeon can leave the case in the sure and certain hope that there will be no resurrection of the buried sutures.

WASSERMANN'S REACTION FROM THE PRACTICAL POINT OF VIEW.

McDonagh (*Lancet*, April 2, 1910) observes that the Wassermann reaction still holds the field as the approved as well as the most reliable of all tests. In the preliminary stage of syphilis—*i.e.*, the chancre—when the Wassermann reaction is likely to be negative the direct demonstration of the triporemata by dark-ground illumination is commended, but a simpler method, since no special apparatus is required, is staining by means of Chinese ink (Burri's method). A platinum loop full of secretion from the sore is placed upon a slide and is surrounded by seven or eight loopfuls of distilled water and the same quantity of Chinese ink. The whole is mixed and spread on a slide as a blood film is made, is allowed to dry, and is examined with an oil immersion lens. The ink produces a dark background, and the objects under examination stand out white. If the spirochæta pallida be found before the patient gets a rash or general symptoms, and the chancre be so situated as to be easy of removal, it should be removed by the knife, because cases have occurred in which, after excision of a true chancre in which the S. pallida was proved to exist, neither secondary nor tertiary symptoms have followed. Such cases are exceptional and secondaries usually do appear, but when they do their severity is certainly diminished by excision.

In secondary syphilis a positive Wassermann is obtained in 85 per cent of all cases. When there is a rash and the patient has not yet had any mercury, 97 per cent of cases give positive results. When no signs are present 80 per cent are positive. Directly after a course of intermittent treatment the Wassermann reaction is usually negative. When positive the course should be prolonged. When the mercury has been eliminated from the system the reaction may be positive or negative. The greater the number of previous courses, the more likelihood there is of a negative result. Such cases almost invariably become positive the moment symptoms reappear. Should a case give a negative reaction three, six, and nine months after the last course, it can be considered cured. The earlier the disease is diagnosed and the more vigorous the primary treatment, the sooner will a permanent negative reaction be given. The most vigorous of all forms of treatment is by inunction daily under medical control. Injections are less potent and oral administration very much less. Pills no doubt predispose to chronic superficial glossitis and cancer, since syphilis is more common on the continent than in England, but tertiary lesions of the tongue and mouth are very much more common in England than on the continent. Patients with tongue lesions, even those who have taken pills regularly for years, always give a very strong positive reaction; and in most cases the condition steadily gets worse as the pills are continued, but improves when the injections are given. It is not uncommon to find that late syphilitic lesions with a positive reaction, however vigorous the treatment may be at the time, never give a negative reaction.

Taking all patients in the tertiary stage, 70 per cent give a positive result. Many have no symptoms and give a negative result. These may be regarded as cured. Others have no symptoms yet give a positive result. In these visceral lesions may be suspected, such as internal gummata, arteriosclerosis, aortic disease, or the nervous manifestations. When a positive result is given, treatment should be started, except in cases of tabes or general paralysis of the insane, in which mercury usually tends to aggravate and to hasten the course of the disease.

One hundred per cent of cases of general paralysis of the insane and about 60 per cent of cases of tabes give a positive reaction.

A syphilitic woman, or a woman who has aborted several times and gives a positive reaction, may, if rigorously treated during her pregnancy, produce a healthy child. In such a case the child's blood should be tested as soon as possible after birth. If the reaction is positive it should receive a two years' treatment; if negative, it can be considered free of hereditary taint.

Colles's law tells us that a syphilitic child may be born to a syphilitic father without its mother being infected, she being rendered immune. Profeta's law tells us that a healthy child may be born of a mother who became infected during pregnancy, and that the passive immunity of such a child disappears before puberty. Wassermann's reaction shows that in both cases the supposed immune person gives a positive result, and therefore must be regarded as syphilitic and infectious.

Such being the case, the following suggestions must be made:

1. When a man infects his wife both should be rigorously treated, and the woman should be retreated during each pregnancy.

2. (*a*) A syphilitic woman should be treated during the whole nine months of her pregnancy. (*b*) An apparently healthy woman whose blood gives a positive reaction should be so treated during each pregnancy.

3. (*a*) A syphilitic child should be suckled only by its mother, never by a wet-nurse. (*b*) An apparently healthy child, either of whose parents has had syphilis, should only be suckled by its mother. (*c*) Should such an apparently healthy child react positively to Wassermann's test it should receive antisyphilitic treatment. A positive reaction can be obtained in a congenital syphilitic on the day of birth.

A congenital syphilitic is peculiar, in that mercury has little influence in converting a positive into a negative reaction. Children who have had congenital syphilis, and who have received treatment, show no signs for years, yet not infrequently react positively. Such being the case, no rule can be laid down as to how long a syphilitic infant should receive treatment. As our knowledge stands at present, it is safest to give mercury over a period of two years.

The importance of diagnosis in a congenital syphilitic who has never shown symptoms is great, since the reaction has shown the possibility of the next generation inheriting the disease.

Wassermann's reaction is now entitled to play an important rôle in determining the knotty problems of life insurance. A proponent with a recent history or with present manifestations of syphilis is, according to present custom, rejected or deferred by most offices. This is a sound principle. But the facts and conclusions cited in this article justify a closer scrutiny of all syphilitic cases. A candidate giving a positive reaction, even though years may have elapsed since the original infection, should be regarded as ineligible, for such a result usually signifies the presence of a visceral lesion that will ultimately shorten life. The virus has obtained such a firm hold that treatment, while capable of checking its course, can never thoroughly get rid of it. Furthermore, a candidate yielding a positive reaction after shorter lapses of time—say three years from the date of the primary lesion—should be received with caution, for this usually denotes that the early treatment of the patient has been insufficient and inadequate, with consequent liability to the later manifestations of the disease. On the other hand, a candidate may be accepted who, having completed a two years' course of treatment, shows a negative reaction on being tested at intervals of three, six, and nine months after such a course. The influence of syphilis on his chances of life may now be safely discounted. In no case is acceptance warrantable until two years have elapsed since the original infection.

The question will naturally be asked, Why is it that 100 per cent of cases—in other words, all cases—of florid syphilis do

not give a positive reaction? The answer very probably is that, whilst inactivating the patient's serum to rid it of its complement, the first action of the rise of temperature is to cause in some cases a linking of the complement with the antibody which is present in the serum. This would produce a diminution of free antibody, therefore all the fresh complement from a guinea-pig's serum added in the test could not be used up; some would remain free, which combining with the amboceptor from the rabbit's serum would bring about hemolysis of the sheep's red blood-corpuscles.

The complement in a human serum disappears by the third day, even when the serum is kept at a temperature of 0°C. If, then, a patient's serum is kept for four or five days and not inactivated by the usual heating, many of the cases which gave a negative result now give a positive result; 1500 cases have been described in which the serum was used, both active and inactive, with the most gratifying results in favor of the former over the latter method.

Wechselmann in Wassermann's laboratory has made the most interesting experiments to rid the serum of all its complement. He takes 0.9 cubic centimeter of active serum plus 3 cubic centimeters NaCl solution plus 0.5 cubic centimeter of a 7-per-cent emulsion of fresh precipitated barium sulphate. After well shaking this mixture is put into an incubator at 37° C. for an hour and then centrifugalized. One cubic centimeter of the solution is used for the reaction. Of 41 cases which had given a negative reaction, 38 tested in this way gave a positive one. This will make a negative reaction of enormous value, and after testing some hundreds of cases we shall very soon be able to regulate our treatment by means of the reaction.

CHAUFFEUR'S FRACTURE.

THOMAS (*Medical Record*, March 12, 1910) notes that the chauffeur's fracture incident to back-kick in cranking an engine is usually a break occurring lower on the radius and with milder symptoms than those of the usual Colles's injury which has been acquired by falling upon the outstretched palm.

The chauffeur's fracture is usually either transverse or oblique into the wrist-joint. In the latter case it is the lower outer corner of the radial head which forms the fragment. Variations are seen, as comminuted and incomplete fractures, but there are comparatively few cases showing marked radial displacement of the hand or severe silver-forked deformity. Where the lower outer portion of the radius is found detached it is evident that it has been avulsed by the wrenching of the hand which grasped the handle. The few writers on this subject are divided in opinion as to whether the mechanism of the fracture be one of impaction through the palm, as in the ordinary Colles's type of injury, or one of tearing off a fragment of bone by severe ligamentous wrenching. It seems clear to the writer that most of these fractures are caused by avulsion. As is so often seen to be the case, bone is torn rather than ligament where both have been subjected to the same strain. Here the violence is evidently transmitted through the palm in a direction upward and outward while the thumb and fingers encircle the handle. The back-kick wrenches the hand violently in the direction of abduction and extension.

So mild are the symptoms in many of these cases that they are frequently considered to be sprained wrists, and do not reach the surgeon for several days. The chauffeur may drive his car many miles after the accident.

Although easy of prevention, the chauffeur's fracture will continue to occur, and the surgeon should be ready to recognize the presence of fracture when a hasty examination might lead to the diagnosis of a less serious injury.

Immobilization of the forearm and wrist in anteroposterior splints is sufficient in the majority of cases. The fingers are left free and the patient is instructed to move them freely, for by so doing a return to the normal use of the hand will be hastened. Massage by one skilled in the art is of prime importance and should not be omitted. It

may be begun immediately. The prognosis is good in young active adults in whom the deformity is but slight. The patient is usually back to work in three weeks, with a wrist-band to be worn for a week or two after release from the splints.

THE FATTY FASCIAL FLAP IN PLASTIC AND OTHER OPERATIONS ON THE PELVIS OF THE KIDNEY.

W. J. Mayo (*Surgery, Gynecology and Obstetrics,* April, 1910) notes that the records of St. Mary's Hospital show one hundred and twenty-two operations for the removal of kidney stones, up to December 31, 1909. Sixty-nine of this number were performed during the years 1907-8-9, and in all in which the stone was confined to the pelvis of the kidney pelviotomy was done, and the suture line covered with the fatty fascial flap. Rapid convalescence without urinary leakage was in marked contrast to earlier experience in which provision for leakage was usually necessary. The certainty of union without the necessity of kidney drainage, or the danger of secondary hemorrhage, etc., has enabled the writer to substitute pelviotomy for nephrolithotomy, as a method of operation for stone in the pelvis, in nearly all cases.

When operating for stones in the pelvis of the kidney it will often be found that there is considerable increase in the fatty tissue attached to and covering the pelvis. If so the attached fat is not removed, but the incision made directly through it as a part of the wall of the pelvis and sutured as a part of the same with No. 1 catgut. Even should the coaptation of the pelvis incision be imperfect, in Mayo's experience the fatty covering has efficiently protected against leakage. If the opening in the pelvis is large and irregular from tearing during the removal of a close-fitting rough stone, a flap of the fatty fascia can be made from the vicinity and turned across to more perfectly protect the closure. In one instance the pelvis was detached in three-fourths of its extent from the kidney sinus during the removal of a great number of stones from the pelvis and ureter. The patient was obese, the kidney deeply placed, and it appeared as though nephrectomy would be necessary; but the pelvis was sutured back to its position with catgut sutures taking in the kidney substance, and the suture-line covered with the fatty fascial flaps. Primary union followed.

In using the fatty fascial flap it is not necessary to suture it closely, but merely to place it over the point to be protected and hold in place with two or three catgut sutures applied in such a manner as to keep the parts in apposition.

For operations upon a kidney which is not the seat of a new growth (unless of large dimensions) the posterior oblique incision is used. The patient is placed prone with moderate elevation of the loins exposing both lumbar regions so that the second kidney can be quickly exposed from behind, if necessary, to obtain exact knowledge as to its condition before undertaking a serious operation on the organ primarily affected. The incision is made about four inches in extent, starting two or three inches from the spine above the twelfth rib, extending downward to the iliac crest in a line with the outer border of the quadratus lumborum muscle. If necessary the incision is enlarged and the twelfth rib is exposed and divided behind the angle. In doing this the pleura is sometimes opened, and if this occurs it should be sutured with catgut to the posterior muscles by deep sutures. The pleura has been opened a number of times in such cases, but with the patient lying on the face during operation, neither collapse of the lung nor any other harm has followed.

Kelly justly calls attention to the superior lumbar triangle as a most important landmark in surgery of the kidney. Incision through this space gives ready exposure to the organ.

Care should be taken not to divide the ileoinguinal and the ileohypogastric nerves which run in the line of incision. The kidney is drawn up into the wound and the pelvis and upper ureter exposed in the kidney notch, usually from behind. In some

cases, as shown by Bröedel, the blood-vessels pass to the kidney from behind, and therefore the notch is more marked in front. The fatty capsule is stripped from the kidney to the extent necessary to free the organ, and a fatty fascial flap raised either before or after making the working incision in the pelvis. After the operation is completed the fatty fascial flap is placed in position and held by a few catgut sutures; the kidney is replaced and drainage secured by folded strips of rubber tissue, not with gauze, as that might lead to secondary fistula.

ACUTE DIFFUSE SUPPURATIVE PERITONITIS FROM A RUPTURED PUS TUBE.

Bovee (*Surgery, Gynecology and Obstetrics,* April, 1910) observes that it is quite probable that when the purulent contents of a Fallopian tube have become sterile, rupture of that structure with escape of its contents into the peritoneal cavity may occur with little or no harm to the individual of which it is a part. His present contribution has reference to Fallopian tubes distended to a considerable degree by infected fluids, to which is added the phenomena of sudden and notable rupture of the tube with escape of the contents into the general peritoneal cavity.

An inquiry into the causes of pyosalpinx rupture into the peritoneal cavity with resulting acute peritonitis carries with it the presumption that the infecting organism in the tube was permitted to pass through the rupture in sufficient strength to immediately involve the whole peritoneal surfaces in the same process as existed in the tube. The larger part of tubal infections producing suppuration is caused by the gonococcus. Yet in no instance in this series of cases was that organism found in the abdominal contents. In but a few were bacteriological reports made. Frank found the staphylococcus pyogenes aureus, and the colon bacillus was recognized by another. We are informed by some careful observers that the gonococcus is not capable of extensively injuring the peritoneum, and, *per contra,* others insist peritonitis of a fatal character may be produced by this organism unassisted. But those of us accustomed to treat extensively tubal infections and to await an innocuous state of the pus before operation are impressed by the very large proportion in which but a few days or weeks are required for that state to be reached. In these the gonococcus is probably acting alone.

But can all these temporarily quiescent cases be thus produced? If so, can the gonorrheal tube contents be suddenly aroused to fury when allowed in liberal quantities to reach the peritoneum, or is the infection of the tube of a mixed character, all the varieties remaining quiescent until rupture occurs, a period of months in some of the cases reported? In most cases violence of some sort was reported. Perhaps it was not more than transportation to a hospital for treatment for pelvic inflammation, and during the following day or two acute and striking symptoms would ensue; ofttimes the patient has not been out of bed for several days just preceding the rupture. In several instances the traumatic element was childbirth. In this respect the experience of Oleson, of the Cook County Hospital, Chicago, was unique. He had at one time two cases in which this accident caused death in the puerperium. In one the labor at eight months was rapid, and death occurred five days later. In the other the labor was of so short duration that he had not time to get into the ward before the birth; this patient also died in five days.

A few quickly followed curettage, and Legueu reports two that were noticed as soon as the accident occurred, which was during a bimanual examination of the pelvic contents. Two occurred during coitus, and another was probably a direct result of the woman lifting a heavy child.

In the cases that ruptured during labor the symptoms of this grave accident were clouded by those of labor, and in them usually an autopsy gave the first knowledge of the real pathology. Fabricius's case is a bold exception and the only one that re-

covered. In the others the symptoms are quite like those of ruptured tubal pregnancy or tubal abortion. Usually, however, the patient is ill with pelvic inflammation, but perhaps does not remain in bed. While at her duties, after recovery from an attack of infection of the uterine appendages, or resting comfortably in bed, perhaps in a hospital preparatory to surgical operation, she suddenly experiences excruciating localized pain, perhaps a chill and collapse. Fever and high thready pulse promptly follow, if death does not soon supervene, and distention of the abdomen, together with the general symptoms of diffuse peritonitis, is not long delayed. Sometimes the surgeon being familiar with the pelvic contents before rupture has readily discovered after it that the tube was collapsed and flaccid instead of full and tense as before rupture.

When rupture occurs during labor the accoucheur should discover a considerable softening in a mass existing at the side of the uterus before labor, and symptoms of peritonitis appear so promptly that they should be readily recognized. The cause of the peritonitis would then have to be learned by a process of exclusion and a knowledge of the antepartum symptoms; and tubal conditions will markedly assist in reaching a correct diagnosis. In nonpuerperal cases the previous history of pelvic infection accompanied by suppuration, the absence of evidence of pregnancy, especially tubal, together with the rapid appearance of the symptoms of diffuse peritonitis, should be sufficient for a diagnosis. When the right tube has thus ruptured it has been mistaken for fulminating appendicitis. The previous history will be an important element in making differentiation. In those cases in which the vermiform appendix is simultaneously markedly involved the differentiation or possibility of diagnosing both conditions is not always present.

All of the eighteen cases not operated upon died. The time they lived after rupture varied from a few hours to three and a half months. Two patients admitted to hospital on the fourteenth day after rupture lived respectively four and twelve days. Of the twelve others that died without operation of which data is obtainable the average number of hours they lived was fifty-nine.

Thirty-eight were operated upon, and fourteen of them died—a mortality rate of 37 per cent. One of this series lingered along for three months in the hospital, and yet her operation was but nine hours after rupture. But three of the postoperative fatalities were in patients operated on during the first twenty-four hours after rupture. Of the twenty-three in which successful operations were done, in twenty it was performed during the first twenty-four hours. The other three successful operations were done, one on the third and two on the sixth day. Twenty-five of the operations were done during the first twenty-four hours. In one of these no result was given. In the other twenty-four operations five were successful. One of the five deaths occurred in nine hours, one in fifty-four hours, and one in three months. The three patients operated on during the second day all died. Of three operated on the third day, one recovered. Of the seven operated on more than three days after rupture had occurred, four died. We find the mortality rate, then, for operations during the first day after rupture was (excluding Anderson's case) nearly 21 per cent; for those done during the second day, 100 per cent; for those during the third day, 67 per cent; and for those done after the third day, 57 per cent. It would seem that if possible all cases should be operated upon, since in all of the eighteen reported in which no operation was done death resulted. The comparatively small mortality rate of the first-day operations would seem to demonstrate the decided urgency of operating the first day and without delay. While but one of the six operations done on the second and third days was successful, three of the seven done at more remote periods were successful, and we should be encouraged to operate even if considerable time has elapsed since rupture, although moribund patients do not present a hopeful spectacle to the abdominal sur-

geon. The late lamented Cartledge states in the report of his fatal case of this kind that enthusiasm and ignorance of early experience led him to operate, but that greater experience and better judgment would form an opposite decision.

GONORRHEAL ARTHRITIS—VACCINE TREATMENT.

JACK (*Glasgow Medical Journal,* April, 1910) reports four cases, all of them improved. In three instances a polyvalent vaccine was used. The injections were controlled by observation of the opsonic index. Attention is called to the fact that autogenous vaccine is much more potent than any other form. Small doses at short intervals are advised rather than large doses at long intervals. The first three weeks of acute infection only very small doses, 500,000 to 2,000,000, are permissible. In gonorrheal arthritis, if the index cannot be obtained as often as desirable, routine injections of one to two millions may be given every three to five days, or five millions every five to seven days, or ten millions every eight to ten days. Larger doses are seldom advisable, and treatment should always be begun by small and carried on by gradually increasing doses. It is stated that the vaccine method of treatment compares more than favorably with other methods of treatment, even when the polyvalent stock vaccine has to be used.

FISSURE OF THE ANUS.

PYBUS (*Practitioner,* April, 1910), describing the method by which he considers the diagnosis of simple fissure easy, says that causes such as polypi should be excluded by rectal examination. Large size and induration would suggest malignancy, while multiplicity and the presence of condylomata definitely point to syphilis.

In other cases a foreign body may be lodged between the folds of the anal canal, giving rise to symptoms similar to fissure.

The history of patients suffering from fissure is sufficiently characteristic to allow of a probable diagnosis being made. The affection may have a sudden onset when due to tearing by scybala or foreign body, great and intense pain coming during defecation. In other cases the condition may arise gradually, at first only a discomfort occurring, but later intense pain. Following the usual series of questions one gets the following history:

Pain, severe tearing pain, when the bowels are opened, often enough to make the patient feel sick and faint, and certainly to make him put off defecation as long as possible. The pain may last a few minutes only; more often, however, it lasts for at least half an hour, while in other cases there is pain and discomfort for twenty-four hours after defecation. In others there may be irritation and discomfort in sitting or walking.

There is rarely much bleeding from a fissure. A drop or two of blood is occasionally noticed on the motion. The discharge resembles the blood in quantity. In character it is usually serous and is just sufficient to stain the linen. A large amount of discharge suggests a fistulous tract. Protrusion of the parts from the anus during defecation does not occur unless piles or a polypus be present. Constipation is a marked feature, hard scybala forming the usual character of the motion. Occasionally thin pipestem-like stools are passed, owing to the insufficient dilatation of the sphincter.

The treatment of fissure may be palliative or radical, depending on the state of the parts or the wishes of the patient. In the early stages the fissure may get well without operation; in a number of cases spontaneous cure occurs. This may be brought about by attention to the diet and the administration of such a preparation as confectio sennæ at night, which corrects constipation and renders the motion soft, and so diminishes the pain of defecation and further injury to the fissure.

After defecation the parts are carefully cleaned with some soft tissue or cotton-wool, and finally bathed with soap and water. A small wisp of wool should be

worn between the buttocks. Before and after defecation a suppository of ol. theobroma alone or with the addition of hazeline may be introduced into the rectum. When much pain is present a suppository containing ¼ grain of cocaine may be introduced half an hour before defecation.

In cases of longer duration some may be cured—though this cannot be definitely promised—by means of a simple operation performed under local anesthesia. A few minims of a solution of adrenalin and eucaine having been injected into the skin near and under the base of the fissure, the sentinel pile, if present, is removed and the base of the fissure incised, till the superficial fibers of the external sphincter are divided. The edges of the fissures are then removed and a small dressing is applied. The treatment detailed above is then carried out, as regards the bowels, etc. In all cases bodily rest is an important factor in treatment.

In cases of longer standing, in which much spasm is present, and in which it is essential to explore the rectum, or cases in which complicating conditions are present, a general anesthetic is required, and a stay in bed of at least fourteen days demanded.

The operation is carried out as follows: The patient being in the lateral or lithotomy position, the sphincters may be dilated or not. The index-finger is inserted into the rectum, and with the thumb outside the anal margin is everted and grasped between finger and thumb. The fissure is then incised with a scalpel or bistoury till both portions of the external sphincter are divided, the incision being prolonged on to the skin for about one inch. The sentinel pile is removed as well as any redundant margin of the fissure. The anus should now be almost patulous. The rectum should be further examined for any of the complications mentioned above, which may be treated at the present time. A small plug of wool is inserted into the wound and a pad and bandage are applied. There is rarely any pain after such an operation. An aperient should be given three days after the operation, when the plug is also removed. The wound requires daily dressing and should be carefully attended to after defecation. After a week the finger may be passed into the anal canal to see that no bridging or irregular healing occurs. The bowels should be open daily. Rest should be enjoined if possible till healing is complete. It is necessary for some time after the operation that the bowels should be regular and the motions kept so soft that recurrence is prevented.

TERMINAL ARTERIAL ANESTHESIA.

RANSOHOFF (*Annals of Surgery*, April, 1910) shows a method of anesthesia applicable to a group of cases in a limited area of the body. Two cases are reported in which the results were entirely satisfactory. The technique is as follows:

The main artery supplying the part to be anesthetized is exposed under infiltration anesthesia. An Esmarch strap is now bound about the limb some distance above the point of proposed injection into the artery. The Esmarch should be used as in the Bier hyperemic treatment—that is, snug enough to constrict the veins, but not so tight as to interfere with the arterial circulation. From 4 to 8 Cc. of 0.5-per-cent cocaine in normal salt solution should be injected into the artery in the direction of the blood stream. The needle used should be as fine as possible. After anesthesia is complete, the Esmarch may be tightened, if perfect hemostasis is desired. At the end of the operation the Esmarch is removed and the wound closed. The maximum dose suggested (that is, 8 Cc. of 0.5-per-cent cocaine solution) contains only 0.04 of cocaine—a safe dose. This method of anesthesia is an ideal one for certain areas of the body where general anesthesia is contraindicated. It is particularly applicable to the upper extremity, where the brachial, radial, or ulnar artery may be exposed with little difficulty. For the larger operation on the lower extremity, where general anesthesia is contraindicated, spinal anesthesia seems more desirable, but for the operations about the foot and ankle this anesthe-

sia has a distinct place. The greatest advantage of this procedure is its safety, which depends on the small quantity of dilute cocaine solution used and its probable diffusion into the tissues.

ANESTHESIA BY COLONIC ABSORPTION OF ETHER.

SUTTON (*Annals of Surgery*, April, 1910) states that up to this time he has administered ether by this method to about 140 cases in the surgical service of Roosevelt Hospital. The results were in all instances satisfactory. In only one instance, however, was the attempt made to administer the anesthetic per rectum from the beginning. This proved so slow and so uncomfortable and distasteful to the patient that after about twenty minutes a cone was used to complete the initial establishment of anesthesia. The longest operation of the series consumed two hours and twenty minutes, the shortest time five minutes—the average time being fifty-three minutes. The average consumption of ether was 87 grammes per hour in the 64 consecutive cases in which record of this point was kept.

Twelve of the 100 cases had a preliminary injection of morphine and scopolamine.

In 25 cases oxygen was used as a vehicle for the ether vapor.

Forty-three cases had some time in the operation a supplementary administration by the mouth of ether or chloroform, and 12 belched gas from the stomach in the course of an anesthesia.

Forty-three cases vomited or regurgitated stomach contents after operation.

Twelve had abdominal pain.

Five had bloody stools or blood-streaked return from the postanesthetic enemata. All cleared up in from a few hours to three days, and in none was the loss of blood accompanied by noticeable weakness or abdominal pain.

The most severe of the cases continued to pass small quantities of blood for three days, during which they also vomited persistently. In the series of cases there were five deaths from all causes, and in none was the method of administering ether a contributing factor. The optimum pressure to be maintained in the colon has been determined experimentally to be about 20 mm. of mercury, which is approximately equal to the sum of the positive pressure in the intestinal capillaries and the negative pressure in the portal vein. This should be reduced to 10 or 12 mm. in young children, and may be increased in individuals with abnormally high blood-pressure.

On account of the inevitable loss of ether from the blood in its passage through the lungs, it is sometimes necessary to adopt means for keeping the respired air more or less laden with ether. Also, relatively high concentration of the anesthetic mixture must be used. Danger of too great concentration of ether is obviated by employing oxygen as a vehicle and by keeping the ether from which the vapor is derived well below its boiling point.

Cunningham's apparatus was first used at the Roosevelt Hospital. Thereafter it was modified, and now consists of (1) a generator in which the mixture of oxygen and ether is produced; (2) an afferent tube system which carries this product into the intestine; and (3) an efferent tube system for the purpose of exhausting the contents of the gut.

The patient must be prepared by a thorough cleansing of the colon. This is accomplished by a cathartic, by castor oil given the night preceding the operation, and followed in the morning by high soap-suds enemata repeated until the return is clear. Three enemata 1½ to 2 hours apart are regarded as the minimum number.

In alcoholic and very muscular subjects, and in operations on the mouth or upper respiratory tract, it has been found useful to give 1/6 to 1/4 grain of morphine and 1/120 to 1/100 grain of scopolamine hypodermically, one hour before operation.

The anesthetic is started by the pulmonary method and carried to the stage of partial relaxation, when the rectal tube is inserted until its bulb lies just inside the

sphincter. The oxygen-ether mixture is then turned on, the patient's nose and mouth being covered with three or four large sterile towels, unless the operation involves this part of the anatomy.

As soon as pressure in the colon has been raised to the required 20 mm. the exhaust should be opened and the gut allowed to empty itself. This process of filling and emptying the intestine should be repeated three or four times in order to eliminate as thoroughly as possible the natural gases of the bowel. The needle valve of the oxygen tank is then set at a point which just maintains the required 20 mm. pressure, and usually demands little or no further adjustment during the rest of the operation. If the patient tends to come out from the influence of the anesthetic the bowel may be emptied from time to time to carry out any intestinal gases which tend to dilute the anesthetic mixture. Oxygen should be used as a vehicle because it lessens the danger of anesthesia and because it greatly diminishes the rapidity and depth of respiration, in some cases even causing the phenomenon of apnea of hyperoxygenation, thus greatly reducing the loss of ether through the lungs; and thirdly, because of its obviating the necessity of frequent use of the exhaust and hence contributing to the smoothness of the anesthesia and the comfort of the anesthetist. Usually a smooth anesthesia continues.

The temperature of the water-bath should not be allowed to rise above 90°. Too shallow narcosis is met by adjusting the face towels, and if this is not sufficient, by introducing anesthetic mixture under the towel from the accessory mouth tube.

Too deep narcosis is met by temporarily shutting off the stream of oxygen and allowing the exhaust to remain open for a short time, or by markedly reducing the pressure without opening the exhaust.

The depth of narcosis is determined by the pupils, which are usually at maximum contraction in complete anesthesia by this method (if scopolamine and morphine have not been administered, when of course they have little value), by the degree of muscular relaxation, and by the color which may be noted from the lips and face, but better from the color of the blood in the wound. The character of the respiration is of less value, except that short, shallow, jerky respiration when associated with dusky color is a danger sign. Muscular tone is best determined by the tension of the jaw muscles and from the presence of voluntary movement of the tongue. It is the author's habit in using this method to keep one finger in the patient's mouth to detect the first active tightening of the jaw or voluntary movement of the tongue. Sufficient ether need not be given to make the lower jaw entirely relax, but merely enough to prevent actual biting of the finger.

Difficulty in breathing is readily overcome by extending the head on the neck by simply pulling with the finger upon the upper incisors. At the end of the operation the bowel is filled with oxygen to a pressure of 20 mm. and emptied several times, these "oxygen enemata" serving to carry off the greater part of the unabsorbed ether. As soon as the patient returns to bed a high soap-suds enema is given, being siphoned off as soon as necessary. This tapping is repeated in half an hour. The author summarizes the indications and the contraindications as follows:

It is indicated in operations upon or about the respiratory tract (head, neck, and chest), especially such as lay open the mouth, larynx, pharynx, and trachea.

Operations upon patients in whom ether absorptions must be minimized on account of lung, heart, or kidney lesions.

Operations upon cases already suffering from respiratory embarrassment.

It is contraindicated in operations upon cases presenting lesions of the alimentary tract, especially such as might cause weakness of the wall of the colon.

Laparotomies in general, except such as do not open the general peritoneal cavity—*e.g.*, suprapubic cystotomy. This because of the interference of the inflated colon with the work of the surgeon.

Operating upon cases with markedly incompetent sphincter or with large complete

fistula *in ano*. A patient with an open appendicostomy would offer the same difficulty of leakage.

Operations upon cases suffering with orthopnea. In these cases it is usually impossible to inflate the colon because of the obstruction caused by the weight of the other viscera resting upon it.

In emergency cases in general because of the lack of preparation of the colon.

The points in favor of the method in cases in which its use is indicated may be summed up as follows:

Freedom of operative field from contamination by the anesthetist.

Ability to maintain a smooth and continuous anesthesia in operations involving the respiratory tract, thus shortening the time and reducing the shock of operation.

Uniform depth of anesthesia, causing light narcosis and a marked saving in ether.

Lessening of pharyngeal and bronchial secretion and of tonic contraction or troublesome relaxation of jaw muscles.

Ability to administer oxygen without interruption of anesthesia.

Minimized loss of heat during operation because of diminished sweating and ether refrigeration.

Reduction of postoperative vomiting and nausea.

The only point against the method in cases in which its employment is indicated is the occasional difficulty in maintaining profound anesthesia without the use of the supplementary mouth tube.

TREATMENT OF GASTRIC AND DUODENAL HEMORRHAGE.

FINSTERER (*Beiträge zur klinischen Chirurgie*, Bd. 65, H. 3) concludes a consideration of the treatment of hemorrhage from the stomach and duodenum as follows:

In a single acute hemorrhage internal treatment with complete rest of the stomach should be carried out; in chronic cases characterized by often repeated small hemorrhages operation should be done on account of the danger of grave anemia. Operation consists in excision of the ulcer when its location is favorable, as the pylorus or the lesser curvature. If excision is not possible, there is carried out either ligation of the bleeding vessel after opening the stomach or ligation of the arteries of supply to the ulcer after the method of Witzel. In cases of pylorospasm posterior gastroenterostomy is indicated in ulcer at the pylorus, and is also desirable when the lesser curvature is the seat of the ulcer. Gastroenterostomy is also a valuable procedure in small ulcer which does not involve the entire stomach wall, but is of no value in calloused ulcer. In high-grade anemia, in order to avoid the danger of general anesthesia, operation should be done under local or lumbar anesthesia.

THE TREATMENT OF PROGRESSIVE FREE PERITONITIS.

GERSTER (*Annals of Surgery*, April, 1910), after calling attention to the decreasing mortality of progressive free peritonitis, thus sums up the principles which should guide treatment:

The most important preparation—to be done if possible before induction of anesthesia; if not, directly after tolerance has been attained—is, where indicated by frequent vomiting due to paralytic ileus, lavage of the stomach. Under proper indications, while the field of operation is being prepared, the heart action is stimulated by saline intravenous infusion and by hypodermic injection of alcohol, or of camphor and ether.

The anesthetic generally employed is nitrous oxide gas, followed by ether administered by the drop method.

The first object to be attained is always the exposure of the primary focus of infection. In the absence of a reliable indication as to the viscus from which the infection comes, a Kammerer incision is preferably done on the right side. The reason for this is the knowledge that in the majority of cases peritonitis is caused by affections of the appendix and, next in frequency, of the gall-bladder. The incision should be ade-

quate—that is, neither too large nor too small. Rapidity of action being paramount, a minute incision may delay work by the difficulty of finding the nidus of the trouble; or, on the other hand, too large an incision will prolong the operation by demanding more sutures. Eventration should always be prevented by suitable measures.

The leak in the viscus, especially if it concerns the stomach, duodenum, and small intestine, should be stopped by suture. In appendicular cases the diseased appendix should be removed and the lumen closed by simple ligature. If the tissues are brittle or gangrenous, the site of the trouble should be packed with iodoform gauze.

The utmost weight is placed on husbanding the patient's strength by gentleness and rapidity of procedure.

The escape of the exudate from the iliac fossa, the pelvis, and flanks, is favored by the gentle insertion of a rubber-gloved finger or hand. No irrigation is employed.

The right iliac fossa, and if necessary the cul-de-sac of Douglass, are drained by the placing of a stout but soft rubber tube, fenestrated at the distal end and containing a loose wick of iodoform gauze. The gauze wick favors the escape of enormous quantities of serum during the first forty-eight hours after the operation. To absorb all that is brought up by the gauze wick, the external dry dressings are frequently changed. As soon as the capillary drainage begins to lag, the wick is withdrawn, the tube remaining *in situ*. To prevent inspissation and retention, moist dressings replace the dry ones at this time. The objections raised by various surgeons against the use of rubber drainage tubes have not been sustained by the writer's experience. He has never seen any complications that could with certainty be ascribed to their use. If the discharge remains serous, the rubber tube should be withdrawn on the third or fourth day; if not, the tube is the very thing to permit the escape of pus. Since the abandonment of massive gauze packings in 1899, mechanical ileus has occurred less frequently.

The wound is closed by three layers of superimposed sutures, one uniting the peritoneum, the second (chromic catgut) the sheath of the rectus muscle, the third the skin. Usually the drainage tube is allowed to project from the lower angle of the wound.

Paralytic ileus continuing, lavage of the stomach is done as often as needed. Very rarely is enterostomy required to evacuate gas and liquid feces from the small intestine. When necessary a distended coil is withdrawn, and an extraperitoneal stab is made. The aperture is immediately closed by one or two Lembert stitches. Peristalsis of the large intestine is induced by low enemata; if these fail, by a high enema; and if this also fails, by repeated rectal lavage.

Opiates are administered hypodermically whenever required. After the operation nothing will better allay restlessness and spare the strength of the patient than an opiate.

Food and drink are absolutely withheld as long as vomiting is present, but rinsing of the mouth is permitted.

Murphy's proctoclysis is systematically employed by the writer, and its use can be warmly recommended. It is important strictly to follow Murphy's directions in the arrangement of the apparatus, so as to avoid hyperdistention of the rectum. Eight to ten pints of normal saline solution will be readily absorbed in twenty-four hours. The essential point is that the reservoir should not be suspended higher above the level of the buttocks than what is hydrostatically necessary just to overbalance the intra-abdominal pressure. The elevation should have the effect of causing the entrance and absorption of one and a half pints of normal salt solution within from forty to sixty minutes. This quantity is to be given every two hours. "The flow must be controlled by gravity alone, and never by forceps or constriction of the tube, so that when the patient rapidly endeavors to void flatus, or when he strains, the fluid should rapidly regurgitate into the can, otherwise it will be discharged into the bed" (Murphy).

The operation finished, the patient is

placed in Fowler's position; this is maintained as long as distention, vomiting, and a high rate of pulse are present.

Persistence of fever after the disappearance of vomiting and distention indicates the search for secondary intraperitoneal abscesses. According to their ascertained situation, these are attacked from in front, or through the loin, or through the vagina or the rectum.

Laxatives, usually calomel and salts, are not administered before the stoppage of projectile vomiting.

Packings that wall off necrosed areas are left *in situ* until they become loose and detached by the process of granulation.

To recapitulate, all our measures are dominated by these requirements: Early and rapid operation; stopping of leakage; peritoneal drainage, aided by posture; maintenance of the patient's strength by enteroclysis; withholding of food and drink while vomiting persists; and, finally, the discreet administration of opiates.

THE TREATMENT OF BONE AND JOINT TUBERCULOSIS BY MEANS OF THE X-RAYS.

Iselin (*Deutsche Zeitschrift für Chirurgie*, Bd. 103, Heften 3 to 6) states that in the beginning of the treatment of bone and joint tuberculosis by the *x*-rays, the rays are applied three or four times in succession at brief intervals, but each time at a different side. The rays are tempered by passing them through a plate of aluminum 1 mm. thick. As injury to the skin appears after two or three weeks' treatment, a space of three or four weeks is then allowed to elapse before treatment is continued again. In no case was more than three such series of treatments required. After healing has occurred the after-treatment consists in rendering the joint movable by means of hot-air baths, massage, and movements. The treatment was tried on ten cases of bone and joint tuberculosis. Almost always the healing progressed by visible strides even in some hopeless cases. This treatment is not suitable for children, because of the injury which the rays may do to the epiphysis. Whether the penetration of the rays is great enough to be of value in treatment of the large joints in adults has not been determined, because their use has thus far been confined to the smaller joints. Within these limits the *x*-rays give excellent results and are able to supplement the customary surgical treatment, and in adults to substitute that treatment.

PATENT THYROLINGUAL DUCT AND ITS AFFECTIONS.

Comroe (*Pennsylvania Medical Journal*, March, 1910) reports three cases which came under his personal observation: One treated by operation, one after a number of unsuccessful operations by another surgeon and by the *x*-ray, and the third still under treatment. As to the embryology of the affection, Weglowski is quoted to the effect that in 30 per cent of bodies he has found an incomplete development of the median portion of the thyroid gland with a primitive passage to the base of the tongue, either in the form of a separated small portion of the gland, a canal, or a cyst. At the upper end of this passage or tract there is found a depression 1 centimeter in depth known as the foramen cecum. The tract or duct connects the thyroid isthmus with the apex of the lingual V. It is connected with the hyoid bone in front and the thyroid bursa behind. Embryologically the first cleft between the first and second arches forms the auditory canal. The second cleft between the second and third branchial arches has its inner opening in the region of the tonsil, and it is the persistence of this cleft which is responsible for the persistence of this congenital pathological condition. The thyrolingual duct extends from the base of the tongue down the middle line of the neck, back of the hyoid bone to the upper portion of the anterior surface of the trachea. Here it bifurcates, each branch running to the lateral lobe of the thyroid gland. The lesions may appear as tumors or cysts at the base of the tongue or latent cysts and fistulæ.

The pathological condition may appear at any age. The shape of the duct is usually very irregular, exhibiting many branchings and ramifications. Casts have been made in some instances showing most unique shapes. In the wall of the cysts and fistulas, mucous glands and small mucous cysts are invariably present, explaining the common finding of mucus as their contents. Microscopical examination proves the diagnosis by the finding of cylindrical epithelium, of the ciliated type, as the lining membrane of the cavity or the duct. The cyst walls may contain definite thyroid substance.

Treatment consists in radical and complete removal of the fistulous tract with the extirpation of all mucous glands, cysts, thyroid tissue, etc., to prevent recurrence. This may require resection of the hyoid bone. As an adjuvant to operation the *x*-ray is regarded as having a useful field. Its modus operandi is probably by counter-irritation, the production of an endarteritis obliterans in the vascular lining of the duct, thus diminishing its secreting properties, and its well-known favorable action upon the lymphoid tissue.

CANCER OF THE COLON.

Don (*Edinburgh Medical Journal*, May, 1910) observes that while cancer of the colon is an affection common about the age of fifty, he has met with it in a girl of about eighteen and in people over 70. It occurs as a scirrhous or hard ring or narrowing of the bowel, and as a large fungating fleshy mass situated on the wall of the bowel, usually on one side only and protruding into the lumen. The lymphatic glands of the colon correspond almost entirely to the arrangement of the arteries. The blood-vessels of the colon are not regular, but generally one can make out a vessel going toward the cecum and supplying the lower end of the ileum, the cecum, and ascending colon: this is the ileocolic artery. A branch of the superior mesenteric artery goes to supply the transverse colon, and another to the hepatic flexure. The first is the middle colic and the other the right colic artery. A fairly large branch of the middle colic may replace the right colic. The left colic artery, a branch of the inferior mesenteric, arises high up close to the duodenum, and passes out toward the splenic flexure. The sigmoid arteries may be branches of this artery, but more often they arise as two separate branches from the inferior mesenteric lower down.

All these vessels anastomose by arches with one another and with their own branches, so that in very few places would a blockage of a single stem completely cut off the circulation to any part of a healthy colon, though Kronlein points out that in four cases out of five the transverse colon itself will not be nourished in its whole extent if the middle colic vessels are ligated.

Following the arrangement of the arteries, we may describe an ileocolic, a middle colic, a left colic, and a sigmoid group of glands. These groups are not detached units, but each group consists of (1) some mere glandular nodules in the walls of the bowel and in the appendices epiploicæ; (2) a marginal chain, well seen when diseased, lying close to the mesenteric border of the bowel; (3) glands occupying the angles where the arteries divide to form arches, and also many connecting glands lying along the branches of the vessels themselves in the mesocolon, or, if this is absent, in the retroperitoneal tissue; (4) glands lying close to the origin of the branches and in front of the large abdominal vessels. These form, when enlarged, easily recognizable masses behind the duodenum and downward to the aortic bifurcation on the inferior mesenteric.

The lymph is finally discharged into the lumbar chain of glands, but the lower end of the pelvic colon sends lymph vessels direct to the lumbar glands.

One reason for dividing the glands into the above groups is that so very few of the lymphatic vessels pass the group of glands lying close to the bowel, and these few reach the intermediate glands along the course of or at the bifurcation of the arteries, and consequently there is little

chance of early infection of the glands round the origin of the arteries, which would necessitate their removal by ligature of the main vessels and a tedious dissection of the glands.

The above is less true of the lymph arrangement at the hepatic and sigmoid flexures, where lymph vessels go direct to the glands on the main vessel without entering the intermediate glands. This makes the prognosis in cancer of these regions less hopeful. There is also a lymphatic connection between the splenic flexure and some glands lying over the splenic and renal arteries, and also between the transverse mesocolon and the glands of the great curvature of the stomach and omentum, and again between the hepatic flexure and the glands about the head of the pancreas and duodenum. The close relationship is easily understood when one keeps in mind the communication between the blood-vessels supplying these organs.

In planning the removal of cancer of the colon, the chief point to remember is the dissemination of the disease. If the glands be palpably affected close up to the origin of the colic arteries, and if the hard irregular outline of a cancerous gland as contrasted with the smooth regular enlargement caused by septic absorption from ulceration be made out, or if the peritoneum in the neighborhood of the bowel wall be studded with cancerous nodules, or if the liver be already affected, there is no possibility of complete extirpation of the disease.

The question of local removal may still have to be determined, for the surgeon can now see how soon the bowel will reach the state when obstruction will take place; and though he knows he is not curing the patient of the disease, he should consider the advantages of an immediate anastomosis with removal of the stricture as compared with a future enterostomy, when obstruction has supervened.

If obstruction is already present, it is almost universally agreed that some form of drainage of the bowel should be carried out for some days.

Later an anastomosis may be desirable, and in draining the bowel one should keep this in view. Paul's operation is one of the simplest and safest methods of effecting both.

The question of the extent of colon to be resected is next considered, and this should be determined more by the ease of anastomosis of the cut ends than by the question of actual bowel involvement, for it is always wiser to remove too much than too little. By mobilization of the bowel the whole operation can be done completely extra-abdominally in all but very stout people. Mobilization is accompanied by cutting or tearing through the peritoneum externally to the bowel, and then by gentle insinuation of the fingers behind, stripping the bowel from the posterior abdominal wall up toward the origin of the vessels. At the hepatic flexure care is necessary so as not to injure the duodenal vessels, nor raise the kidney from its bed; and at the splenic flexure the costocolic ligament has to be divided to allow the bowel to be brought out. The ureter may be lifted forward with the peritoneum, and must be gently freed and replaced to avoid including it in the ligatures.

When enough of the bowel for easy union has been brought out, the next step is to ligate the vessels, beginning opposite the disease. This is done as near to their origin as possible. Working from this point the bowel is reached along two arms of a V, each vessel being tied when seen or felt pulsating, and the rest of the mesocolon by mass ligatures of silk or chromic catgut. It is then easy to see how much of the bowel has had its blood-supply cut off, and to place the clamps where there will be no danger of gangrene.

The question of method of anastomosis must depend on the surgeon and on the case. The only point of importance to bear in mind is that a leak is almost certain to occur if end-to-end anastomosis is attempted where much of the bowel is uncovered by peritoneum—*i.e.*, where there is no mesocolon. But there is no reason for such anastomosis, as there is far less dan-

ger in removing an extra piece of colon than in anastomosing a movable to a fixed piece of bowel.

The skin incisions have always seemed to follow routine methods. Central and semilunar ones are still the rule. There is no objection to the first, if perfect primary union takes place after layer sutures, but the second always means destruction of the nerve supply to the rectus muscle and a certainty of atrophy, with probably a hernia if the patient long survives the operation. The incision parallel to the vessels and nerves gives quite as free exposure as the vertical incision, and a vertical incision at the inner end after dividing the rectus can be added upward or downward as deemed necessary.

With free mobilization of the bowel very little packing off is required, and the patient suffers little shock, from the fact that he may be almost entirely out of anesthesia during the suturing of the bowel. Retraction of the edges of the wound is not necessary, and this, whether done by the hand or by any of the mechanical retractors, always does a certain amount of injury to the parietes, and always produces a certain degree of shock. With the bowel outside, there need be no soiling of the peritoneum, and as there is no tension, the union of the bowel can be made perfectly secure.

As to the method of suture, the author prefers the inner suture to be of catgut, and entered every time from inside the gut as in post-mortem work, while the other suture is also a continuous one and of some less absorbable material, such as silk or cotton thread. The chief point is to bury the mucosa completely, and bring the peritoneal surfaces together without tension.

There does not seem to be much difference of opinion at present as to the necessity of encouraging peristalsis, either by enemata or continuous proctoclysis, though one wonders why some leave the bowel to become quiet before the operation after the aperient has acted. Fowler's position is generally to be preferred as safer, but no position is safe, if safety depends on it. There should be no unrecognized and untreated postoperative peritonitis.

The immediate mortality ought not to be very high, nor does the site of the tumor affect the mortality percentage. In Lardennois's cases, the mortality was at first over one-third, no matter where the obstruction, and in Mayo's cases the percentage mortality differs only a little with the region affected.

The percentage of operative fatalities has diminished greatly during the last decade, and many cases of recovery are recorded. In 1905 Moynihan collected 100 cases with a mortality of 27 per cent, but the majority of these were primary resections.

When the operation is done in two stages, the mortality is about 13 per cent. If we compare this with the old operations done by surgeons whose experience extended to more than 100 cases, we find that out of 475 cases 187 died—a mortality of 40 per cent. Czerny had a mortality of 50 per cent, and Wolfler of 54 per cent.

The greatest danger, viz., attempting to unite an obstructed bowel, is now seldom incurred.

Operative sepsis, which is next to leakage in its fatal consequences, is not so serious as it has often been represented to be. The risk is much the same whether the contents be fluid or solid—whether in cecum or sigmoid. Don is convinced that most of the sepsis follows soiling of the tissues and surfaces after they have been injured by rough swabbing and handling, and by retractors during the operation.

Dudgeon and Sargeant observed that, where disease or obstruction of the bowel had persisted for some time, the streptococcus albus was found in the peritoneal cavity, and that this organism was inimical to a serious attack of peritonitis from bacillus coli infection. This probably minimizes the danger of resection in colon disease.

The main point in abdominal surgery seems to be gentle handling, or rather as little handling as possible, and avoidance of tension at the line of union.

The ultimate results of recent operations on the colon have not been recorded by

very many surgeons. The number of such cases falling to each individual surgeon is so few, and the difficulty of collecting the recorded cases and framing statistics is so great, that we depend on the published records of a few surgeons, and their results would seem to warrant an expectation of cure in over half the cases operated on.

THE CHOICE OF METHOD OF OPERATION IN THE TREATMENT OF KIDNEY STONE.

MAKKAS (*Deutsche Zeitschrift für Chirurgie*, Bd. 103, Heft. 3-6) reports upon the operations for kidney stone in Garre's clinic in Bonn. The author states that more recently there has been a disposition on the part of surgeons to look with great favor upon pyelolithotomy as the method of choice, and that Garre himself finds wide application for this method. In the last few years there have been 30 operations upon 25 patients for kidney stone. This series is divided as follows: Pyelotomy 11, pyelonephrotomy 1, nephrotomy 8, nephrectomy 6, ureterotomy 4. The six cases of nephrectomy as well as five of the cases of nephrotomy did not offer any opportunity for conservative surgery on account of the advanced stage of the affection and destruction of the kidney substance by suppuration. There were only 15 cases which offered a choice between pyelotomy and nephrotomy for the removal of the stone; in 11 of these the stone was successfully removed through an incision in the pelvis of the kidney; in one of the remaining four the stone was so large that it could not be removed through a pelvic incision, and as a consequence a secondary nephrotomy had to be done. In two of the cases nephrotomy was selected because the stone was so deep in the parenchyma that it seemed impossible to remove it through the pelvis, and in the third the stone was very large and had so thinned the kidney substance that its removal through an incision in the kidney seemed more practicable.

Pyelotomy has the advantage that suture is not necessary in order to secure healing without fistula formation; therefore, it is not essential that the kidney be brought out through the skin wound in order to permit the application of sutures. Stones as large as a walnut can be removed through a pelvic incision, and in case the stone is too large for this, the incision can be extended into the kidney substance. The chief objection urged against pyelotomy is that in multiple small stones or in those hidden in the calyces they may be overlooked. The author's experience is that by sounding and feeling with the fingers through the pelvic incision the smaller stones are but seldom overlooked, and the observation is offered that nephrotomy does not always give assurance that no stone has been missed. An additional advantage of the pelvic incision is that a stone quite well along in the ureter may be pushed back into the pelvis and removed by pyelotomy.

In severe infectious pyelitis, in pyonephrosis, or in progressive nephritis, nephrotomy is indicated; also, when the *x*-rays show that the stone is localized in the parenchyma or deep in one of the calyces; furthermore, it is indicated when sclerotic changes have taken place in the fatty tissue around the pelvis, thus rendering its exposure difficult. Large coral-like stones require nephrotomy. In cases in which there has been pain and hemorrhage from the kidney with negative *x*-ray findings and the diagnosis lies between stone and hemorrhage, and at the same time no stone can be felt in the kidney or ureter, nephrotomy is indicated, inasmuch as this operation in itself has a favorable influence. Nephrotomy is avoided by Garre wherever possible because it has been his experience in one case to have necrosis of the kidney substance follow this operation, and in two cases severe after-bleeding to occur, which in one proved fatal. When possible, the pelvic incision is closed with sutures placed in three layers. The first is of the finest catgut and is applied like the seromuscular intestinal suture, the mucosa not being included; the second is a continuous Lembert suture of the finest silk; the third unites the fat layer which covers the pelvis. When

this method is not practicable, the author is content with a single layer suture. With the demonstration that the danger of urinary fistula following pyelotomy is very slight the chief objection to pyelotomy has been removed. Pyelotomy possesses so many advantages over nephrotomy that the author recommends it as the method of choice for the extraction of aseptic or but slightly infected stones.

A CASE OF CEREBROSPINAL MENINGITIS CURED BY TREPHINING THE SKULL.

TSCHERNIACHOWSKI (*Archiv für klinische Chirurgie,* Bd. 91, Heft 4) reports a case of cerebrospinal meningitis in a boy eighteen years of age which was cured by trephining the skull. The patient was taken ill on July 18, 1909, and when first seen on July 20 had well-marked signs of cerebrospinal meningitis. But on account of an inflammatory condition of the left ear the left mastoid process and antrum were opened in the hope of finding localized suppuration. None was found. As spinal puncture had shown the presence of pus it was concluded that a generalized purulent meningitis had to be dealt with, and as the case seemed entirely hopeless and it was desired that some effort be made to save life, trephining of the skull was decided upon. This was done on July 20. An opening 3 centimeters in diameter was made in the posterior fossa of the skull. The dura was highly injected, was tense, and did not pulsate. Three punctures were made with a syringe, and from the last of these 10 Cc. of serosanguineous fluid was removed. The dura was then incised and the space between it and the pia tamponaded. The patient began at once to be greatly improved. By July 24 consciousness had completely returned and the general condition was good. On July 31 the temperature again rose, the pulse became frequent and irregular, and rigidity returned in the neck. On examining the wound it was found that the incision in the dura had closed, and thus the secretion was being retained. The incision was again opened, and by the next day the patient's condition had become satisfactory. On August 22 the patient left the hospital, and was thenceforth treated as an out-patient. By September 16 the wound was entirely healed. On January 8, 1910, the patient, who was a student, was able to resume his studies as before the operation, and examination of the nervous system revealed nothing abnormal. Bacteriological study of the cerebrospinal fluid showed the micrococcus intracellularis meningitidis in pure culture.

In conclusion the author believes that in severe cases of epidemic meningitis recourse should be had to operation without delay, while the fluid is in such condition as to enable it to drain away and before permanent changes have occurred in the brain or meninges, because otherwise, on the one hand, the object of the operation cannot be accomplished, and, on the other hand, later complications cannot be avoided. The author agrees with Kümmell, who says of operative treatment of epidemic meningitis: "If puncture does not accomplish the object, then I would consider free opening of the cranial cavity necessary and would proceed to open it."

RECENT RESULTS OF SURGICAL TREATMENT IN SEVERAL DISEASES OF THE SPINAL CORD.

WILLIAMSON (*Medical Chronicle,* May, 1910) quotes the results of operative treatment as reported by Oppenheim in 25 cases of spinal meningeal tumor, the inflammation being placed in the vertebral canal and outside the spinal cord. In 13 the tumor was found and removed, and there was sufficient recovery from the spinal disease to enable the patient to walk again. An ideal and perfect recovery was obtained in 9 or 10 cases. Thorburn reports 6 cases of spinal tumor, 5 of which were cured and the other relieved by operation.

Sick reports 21 cases of spinal tumor, of which 3 were cured and 2 improved by operation. In spinal serous meningitis, by

which term is meant an accumulation of fluid in the spinal meninges, it is noted that the theca of the cord may be greatly distended and the cord shrunken in the affected region. The condition has been described as simple cyst, serous spinal meningitis, circumscribed serous meningitis, and by Sir Victor Horsley as "chronic spinal meningitis." The symptoms closely simulate those of spinal meningeal tumor, and the cases have usually been operated upon because this diagnosis had been made. Horsley states that the pain is more diffuse in distribution, and not limited to the area of one nerve root. The whole of one limb may be affected with pain, which then spreads to the other limb, and then up the back. The patients become paralyzed first by a gradual sense of weakness coming on in the whole leg. This progresses until there is paraplegia. The legs become spastic and lateral sclerosis is simulated.

Horsley has operated upon 20 cases without any fatal result. Operation often leads to a subsidence of paralysis. A number of successful cases are briefly summarized. In cases of very severe spastic paraplegia and paralysis Förster has recommended for the relief of the great muscular spasm the resection of a limited part of the spinal posterior nerve roots at a suitable level with respect to the motor supply of the spastic limb. It has been observed that improvement occurs in the symptoms, in diseases affecting the lateral pyramidal tracts, when disease of the posterior roots develops, and Förster takes this as the basis of his treatment. He has recorded five cases treated in this manner with benefit, and others have obtained good results.

The results obtained by the operation in Förster's cases were:

The spastic muscular contraction was relieved or distinctly diminished.

The pathological exaggeration of the flexor reflexes of the lower limbs was relieved.

The reflex associated movements ceased or were distinctly diminished.

The operation may be of service in all very severe cases of spastic paraplegia, whether of spinal or cerebral origin. In infantile spastic hemiplegia, when the spasm and associated movements are marked, the operation is indicated.

Förster and Küttner operated on a case of tabes with very severe gastric crises by division of the posterior dorsal nerve roots from the seventh to the tenth. Successful results are reported.

REVIEWS.

THE RELIGIO-MEDICAL MASQUERADE. A Complete Exposure of Christian Science. By Frederick W. Peabody, LL.B. The Hancock Press, Boston, Mass. Price $1.10.

In the space of about two hundred small pages Mr. Peabody presents the most powerful condemnation of this remarkable religious fad which has yet appeared. Repeatedly retained as counsel by those who were well informed as to the controlling factors of this sect, he has had brought into his hands an immense amount of information which leads him to believe in the absolutely erroneous nature of their teachings. In his introduction he starts out with the assertion that "Christian Science is the most shallow and sordid and wicked imposture of the ages; that never before has the world witnessed a masquerade like that of Christian Science. Being everything that Christianity is not, it puts on the garb of Christianity and seizes the name of Christ the better to attract and the more strongly to hold people of shallow mind, but sincere heart. Having nothing in it remotely worthy of the name of science, it meaninglessly appropriates scientific terms and phrases in order to parade before the world with an air of learning." He then deals with the conduct of the founder with the most scathing denunciation, but asserts that if his language seems too severe, an inspection of his pages will reveal the fact that

no words are adequate to express the conditions which exist.

The book is one which the physician can put in the hands of misguided persons, feeling confident that if they have any remnant of good sense left, they will cast aside this hollow mockery after reading it. The publishers ask that postal orders or cash by registered mail be used in ordering the book so as to avoid the bank's charge for collecting small checks.

DISEASES OF THE HEART AND AORTA. By Arthur Douglass Hirschfelder, M.D. Illustrated. J. B. Lippincott Company, Philadelphia, 1910.

There are now four or five excellent books upon this subject, each of which represents up to the date of its publication our knowledge concerning diseases of the heart. A very excellent one, but one now somewhat behind the times, is that of Dr. Sansom, of London. We also have the equally classical contribution of Broadbent and the well written one of Babcock. Still more recently, the able and original work of Mackenzie; and now, within a year after the publication of Mackenzie's second edition, Dr. Hirschfelder's book appears. It is very copiously illustrated, containing no less than 329 illustrations. After opening chapters dealing with the anatomy and physiology of the heart and great vessels, the author proceeds to a consideration of blood-pressure and blood viscosity, describing the various forms of apparatus which are employed for the estimation of these conditions. The fourth chapter deals with the venous pulse and the electrocardiogram in health and disease, interesting illustrations being employed to aid the reader in grasping this newer method of cardiac study. After this there follows a chapter upon the use of the *x*-ray, and then one upon the physical examination of the chest in connection with cardiovascular lesions. After this, the effects of exercise and the symptoms of cardiac diseases, and then there comes a chapter upon the effects of drugs in cardiac disease which is evidently taken in considerable part from Cushny's book upon Pharmacology in the chapter on digitalis. We are glad to note that the author points out that digitalis sometimes does harm in patients whose myocardium has undergone fatty degeneration, as we are quite sure that this point is well taken, but we think too little space is devoted to the combination of digitalis and the nitrites, which is one of the most important therapeutic procedures which medical men possess. Again, we are glad to note that the author insists upon the point that when any disturbance of conductivity occurs digitalis is absolutely contraindicated. The author thinks that strychnine is of particular value in the disturbance of respiration following extreme heart failure with or without digitalis.

After considering the use of drugs in the treatment of cardiac disease, gymnastics and hydrotherapy are considered, and after this the various lesions of the heart muscle and surrounding tissue. The important chapter upon arteriosclerosis is well written. A chapter of very great importance is that on angina pectoris. The various forms of valvular disease are ably discussed both in connection with their pathology and the treatment which should be instituted. But the methods of treating aneurism are not given with sufficient fulness to aid any one who is a novice in these methods. The closing chapters deal with the thyroid heart and the various disturbances of cardiac function which are not associated with organic disease. Each chapter of the book has appended a very considerable bibliography. Altogether, the work is to be considered a most creditable production, strongly tinctured by views obtained by investigations at the Johns Hopkins Hospital.

A MANUAL OF OPERATIVE SURGERY. By Sir Frederick Treves, Bart., G.C.V.O., C.B., LL.D., F.R.C.S., and Jonathan Hutchinson, F.R.C.S. Third Edition, Illustrated. In Two Volumes: Volume II. Cassell & Company, Limited, London, New York, Toronto, and Melbourne, 1910.

The second volume of this excellent manual covers operations of the head, neck, spine, thorax, breast, the arteries, veins and nerves, amputations, operations on bones and joints and on tendons, including

the division of contracted muscles and fascia. There is a very brief discussion of the anatomy of the brain and cerebral localization. The treatment of nevi by the application of carbonic acid gas is not mentioned. Fractures of the skull, which are considered properly a subject of operation, are simple and compound depressed fractures and punctured fractures. The modern instruments used in head work are neither figured nor described. The discussion of intracranial hemorrhage is entirely inadequate. Indeed, it may be said of the whole section devoted to Head Surgery that it in the main disregards the best to be found in current literature.

In a work of this size it is somewhat surprising to find twelve pages devoted to the operation of rhinoplasty. Harelip receives an added ten pages. The entire subject of goitre is covered in eleven pages, and the discussion is so general as to be of little service to the operating surgeon. To excision of the tongue thirty pages are devoted, to operations on the breast twelve pages, to ligature of arteries over one hundred and ten pages. The section upon amputation is excellent.

As a general criticism it may be said that the work is somewhat ill balanced from the standpoint of space devoted to operations in regard to their clinical importance, that modern methods of technique are often omitted, that the operative description is often a scholastic rather than a practical one.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

The past week has been remarkable in that the only topic of interest to the great majority of the "men in the street" was the prize-fight in America. No interest seems to have been taken this year in the lawn tennis championships or even in the intervarsity cricket match, both of which as a rule attract a large amount of attention. It certainly was extraordinary to hear no news proclaimed by the boys in the street except that bearing on the encounter, such as the latest training reports. The boys themselves were as excited as possible. Writing of these boys calls to mind that there is a legislative project on foot to prevent youths under the age of seventeen or eighteen from earning their livelihoods as news venders. It is alleged that this occupation in particular tends to corrupt their morals and make them unfitted for any other occupation in after life. Although these lads practically live by their wits and are certainly very quick at repartee, they learn nothing of value except the latest odds on the principal races, and in the case of those who rise to the top of their profession, how to ride a bicycle in such a manner as to be a menace to the safety of themselves and of any one who crosses the street on foot. They certainly become extremely efficient in dodging the traffic. It is contended that the ranks of the pickpockets are largely recruited from this class. This same bill also deals with a similar class of females. The latest of these are the Busy Bees. They are young girls apparently about fifteen to eighteen years of age who adopt a blue uniform with a characteristically short skirt and a good deal of red surmounted by a cap of similar color shaped like that which used to be worn in the army, and very much too small for any woman with an average quantity of hair. They may be seen walking to work along the pavement side or just in the gutter in the morning in Indian file and mostly out of step. I understand that they do similar work to that which is undertaken by the boy messengers. It is considered that such work is not suitable for women of this or any other age, and the proposed bill is to prohibit this and similar occupations

for women, at least for those of tender age.

The discussions at the Royal Academy of Medicine in the last few weeks did not bring forth anything very startling or new. There is no doubt that therapeutic inoculation has come to stay and is a valuable curative agent. Many instances of success were recorded, but the failures were not particularly emphasized. The leaders of the debate seemed to be largely on the defensive, and were repelling attacks real or imaginary on the treatment. It was instanced that no one can or should expect to cure a chronic infection by a single dose of vaccine any more than chronic constipation by a single dose of magnesium sulphate. It seems a pity that the vaccinators should attempt to despise or relegate to the waste heap all the therapy which the clinician has collected in the past and to proclaim that vaccination is the only treatment of any value. There are some, however, who see the value of the two combined, and it is this class which will come to the front in the end. The combination of the clinician and the pathologist seems to meet the requirements of the future.

About three months ago the sum of £200,000 was offered by an anonymous philanthropist to establish cheap dental surgeries throughout the country. The offer was made to the Secretary of the British Dental Association, and as yet has been neither accepted nor refused, there being lack of evidence as to whether the foundation of such clinics would be to the advantage of the public and the dental profession. The object of the offer is to supply dental facilities at cost price to people who are willing and able to pay small fees, but who are unable to pay the usual fees of dentists. In order to determine how great a need exists for such facilities an experimental dental surgery has just been opened in Shaftesbury Avenue. Two fully qualified dental surgeons will devote their whole time to the patients, and the fees will range from sixpence to £4, which will be the price of a double set of artificial teeth and plates. The new clinic will be run on strictly business principles at fixed prices, and will not be a charitable institution, though help may be given through the Dental Aid Society in particularly needy cases.

Mention has already been made in these columns of the work done by Mr. Waldorf Astor in prophylactic measures against tuberculosis. The National Association for the Prevention of Consumption and other forms of Tuberculosis has just undertaken a new educational campaign. A special appeal committee has been formed, of which Mr. Astor is one of the honorary treasurers, in order to collect funds for the campaign. The means employed will consist of traveling tuberculosis exhibitions, caravans with lantern slides, popular lectures, an information bureau for the press and the public, and the distribution of leaflets. The campaign will be purely educational, and no grants will be made to institutions for treatment. The Association estimates that it will require an income of £5000 annually in order to carry out the work properly. An exhibition which was held in Whitechapel was visited by seventy thousand persons, and exhibitions held in other places have been equally successful. One of the chief objects of the campaign is to create a strong public opinion in favor of a comprehensive and concerted attack on the disease. It is stated that nearly 400,000 persons are suffering from tuberculosis in the United Kingdom, and that one person out of every ten dies of consumption. The total direct and indirect loss to this country is estimated at not less than £8,000,000 a year. With these figures before it the committee contends that "it would be cheaper for the individual as well as for the State to prevent the spread and continuance of this disease, which is not hereditary, but is infectious." We note with pleasure that a special effort will be made to secure the coöperation of working-class organizations, and it is to be hoped that workmen as a whole will soon realize the extreme value of the work which has been undertaken by the Association.

As each summer comes round, even though it is not accompanied by summer

weather, the Fresh Air Fund makes its appeal on behalf of the poorest children of our largest towns. The fund finds supporters in all classes and all the world over. King George is an annual subscriber, and a year or two ago he and the Queen spent part of a summer's afternoon among the children in Epping Forest. Last summer no fewer than seventy battleship crews sent subscriptions. A day's outing for one child will cost only 9d, while the sum of £8 2s. will pay for a complete party of 200 children. In many cases these outings provided by the Fresh Air Fund are the only opportunities that poor slum children possess of tasting the delights of the country.

The Women's Congress has been holding a series of meetings at the Japan-British Exhibition. One of the most interesting discussions was that on Red Cross and General Nursing. It was appropriate that the discussion should take place within the precincts of the Japanese Exhibition, as the women of Japan have done more than almost any other country to take an effective part in national defense. The Japanese Red Cross Society has over a million members, and an income of nearly a million a year. The British scheme for territorial nursing is still in its early stages. The administration and organization work is being done by the War Office, but the work of actually teaching and training the members of the service has been undertaken by the St. John's and St. Andrew's Ambulance Societies. The personnel has been definitely fixed upon. The most distinguished physicians and surgeons have volunteered their services, and a nursing staff is also enrolled whose members are ready to step into their proper places. These nurses are all highly trained women, and their roll is annually revised. Two of these trained nurses form part of each detachment, and will give assistance in the work. Twenty-three hospitals, each containing about 500 beds, have been organized all over the country. These hospitals are not buildings specially erected, but public buildings, such as schools and halls, now in use, which are earmarked for use as hospitals in time of war. One of the advantages of the new scheme is that the training given in first aid and simple nursing will be of value even in civil life.

The necessities of the Naval Medical Service have recently been engaging the attention of the House of Commons. Lord Charles Beresford contended that the corps of naval surgeons should be greatly augmented, and advised that the surgeons of the mercantile marine should be invited to become surgeons in the volunteer reserve. He also condemned the present system of converting merchant ships to hospital uses. Mr. Lee also strongly supported the view that hospital ships built for the purpose were absolutely necessary. He thought it would be useful if the Admiralty would study what the United States Naval Department had done in providing ships specially built for this service. He spoke of the marked difference to a fever patient to change from the stuffy cabin of a West India trading vessel, pervaded with the strange odors of past cargoes, to the large, well-ventilated ward of the hospital ship. It is satisfactory to note that the Secretary for the Navy stated in reply that it is the present intention of the Admiralty to estimate next year for the building of a hospital ship.